

FLORA
OF THE PRAIRIE PROVINCES

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Part III--CONNATAE

In the following families constituting the Connatae, the corolla (and also usually the calyx) is made of fused parts. A few woody plants occur in the Connatae and these will be found keyed with Lignids or Woody Dicots in part I, page 39. Conversely a few herbaceous Lignids and some unusual types from part II with fused corollas are included in the keys below. Similarly some exceptional Connatae with free petals will be found keyed out at the beginning of part II, page 5, along with some unusual types such as climbers, parasites, flowers in heads or umbels, etc.

- a. Corolla regular.
 - b. Leaves alternate on the stem and branches Group A
 - bb. Opposite to verticillate, or all (or mostly)
 - basal Group B
- aa. Irregular.
 - c. Flower spurred Group C
 - cc. Not spurred.
 - d. Leaves opposite or verticillate or all
 - basal Group D
 - dd. Alternate Group E

Group A

Sepals and petals present, the latter fused into a regular corolla. Leaves alternate.

- a. Leaves trifoliate 108. Menyanthaceae, p. 75
- aa. Leaves not trifoliate, mostly simple.
 - b. Fruit, a group of 4 nutlets, often with
 - catchy hooks 105. Boraginaceae, p. 48
 - bb. Fruit a capsule, rarely a berry.
 - c. Ovary inferior 110. Campanulaceae, p. 80
 - cc. Ovary superior.
 - d. Fruit a berry or a large spiny capsule; petioles and peduncles partly fused to the stem and branching in such a way as to produce unusual arrangements of leaves, branches and inflorescences 93. Solanaceae, p. 5
 - dd. Capsule smaller, not spiny.
 - e. Flowers yellow Verbascum, p. 12
 - ee. Not yellow, mostly blue or white.

- f. Capsule 3-locular; style 1
with 3 stigmas ..
..... 103. Polemoniaceae, p. 41
- ff. Capsule 1-2 locular; stigmas 1-2.
 - g. Flowers solitary and nearly sessile in the axils of entire leaves ..
..... Centunculus, part II-p. 137
 - gg. Flowers more numerous or long-pedicelled ..
..... 104. Hydrophyllaceae, p. 45

Group B

Flowers regular as in Group A, but the leaves not alternate.

- a. Leaves all or mostly basal.
 - b. Leaves trifoliate 108. Menyanthaceae, p. 75
- bb. Leaves simple.
 - c. Stemless, the flowers borne from the roots; plant stoloniferous... Limosella, p. 19
- cc. Flowers gathered in an inflorescence.
 - d. Inflorescence spicate ...
..... 109. Plantaginaceae, p. 76
 - dd. Inflorescence racemose Romanzoffia, p. 48
- aa. Leaves opposite or verticillate.
 - e. Flowers sessile, forming a spike.
 - f. Leaves entire 109. Plantaginaceae, p. 76
 - ff. Serrate to lobed.
 - g. Leaves opposite..56. Verbenaceae, part I-p. 194
 - gg. Leaves verticillate Veronicastrum, p. 22
- ee. Flowers pedicellate; inflorescence not a spike Group C

Group C

Like Group B, the flowers regular and the leaves opposite or verticillate, on a leafy stem, but the inflorescence different, and the flowers pedicellate.

- a. Stem leaves only 2 92. Adoxaceae, p. 4
- aa. Stem leaves more than 2.
 - b. Flower clusters subtended by a peltate involucre 30. Nyctaginaceae, part I-p. 141
- bb. No peltate involucre.
 - c. Ovary inferior; flower 4-merous ..
..... Houstonia, part I-p. 183
- cc. Ovary superior, flowers mostly 5-merous.
 - d. Herbs with abundant milky juice ..
..... 52. Apocynaceae, part I-p. 179
- dd. No milky juice.
 - e. Ovary 3-locular Phlox, p. 42

ee. Ovary unilocular.

f. Stamens alternate with the
corolla lobes; leaves with
parallel nerves ..

..... 107. Gentianaceae, p. 70

ff. Stamens opposite the corolla

lobes; leaves pinnately

nerved..80. Primulaceae, part II-p. 130

Group D

Sepals and petals present, the latter fused into an irregular corolla, and the flower spurred.

a. Flowers borne on a scape; the leaves all basal,
or all submerged, or buried in the mud ..

..... 97. Lentibulariaceae, p. 33

aa. Stem leafy.

b. Leaves compound68. Fumariaceae, part II-p. 42

bb. Leaves simple.

c. Leaves alternate 95. Scrophulariaceae, p. 10

cc. Leaves opposite Halenia, p. 75

Group E

Flowers as in D but not spurred and the leaves alternate or all basal, exceptionally verticillate.

a. Ovary inferior111. Lobeliaceae, p. 82

aa. Ovary superior.

b. Stamens 6 or 832. Polygalactaceae, part I-p. 147

bb. Stamens 5 or less.

c. Stamens 4 or less 95. Scrophulariaceae, p. 10

cc. Stamens 5.

d. Inflorescence branched Echium, p. 58

dd. Inflorescence simple, terminal,
spiciform or racemiform.

e. Flowers yellow Verbascum, p. 12

ee. Petals prominently purple -

reticulate Hyoscyamus, p. 6

Group F

Flowers as in E, but the leaves opposite on a leafy stem.

a. Fruit a capsule.

b. Capsule 2-locular 95. Scrophulariaceae, p. 10

bb. Unilocular; leaves larger..... 98. Martyniaceae, p. 35

aa. Fruit an achene or a group of 4 achenes.

c. Fruit a single achene.

d. Leaves deeply divided or compound ..

..... 91. Valerianaceae, p. 4

dd. Remotely serrulate... 57. Phrymaceae, part I-p. 195

cc. Fruit a group of 4 achenes.

- e. Ovary deeply lobed, each lobe maturing
into a separate achene 106. Labiatae, p. 59
ee. Not lobed, but breaking up into 4 achenes
at maturity 56. Verbenaceae, part I-p. 194

Order 50. VALERIANALES

Calyx and corolla of fused parts over an inferior or semi-inferior ovary. Flower usually regular and the ovary with as many cells as carpels.

- a. Calyx lobes wanting or transformed into
a pappus 91. Valerianaceae
aa. Calyx lobes present 92. Adoxaceae

91. VALERIANACEAE (VALERIAN FAMILY)

Mainly the characters of the order, as the other family is an unusual type of doubtful position.

1. VALERIANA L.

Calyx-lobes maturing into a plumose pappus reminiscent of many Compositae, the units of the pappus tightly coiled before maturity. Corolla with 5 lobes, but the stamens only 3.

- a. Stem leaves mostly with 3-5 segments 1. V. sitchensis
aa. Mostly 9-15 segments; flowers smaller 2. V. dioica

1. V. sitchensis Bongard var. sitchensis -- Leaves and main branches of the inflorescence opposite, the flowers mostly alternate on the ultimate branches. Larger stem leaf larger than the basal ones. Basal leaves divided like the stem ones, the leaflets few, entire, mostly 1-3 cm wide. Flowers 5-8 mm long, whitish, gibbose ventrally towards the base and abruptly contracted into a thin stipe-like base. Pappus purplish. Early to mid summer. Wet meadows and light woods at high montane and low alpine levels. -- Wlack-sAka, swAlta-BC, US -- Var. Scouleri (Rydb.) M.E. Jones -- Basal leaves larger, the largest one as large or larger than the stem leaves. Leaflets undulate-dentate. -- swAlta-sBC, US.

2. V. dioica L. var. sylvatica (Rich.) Gray (V. septentrionalis Rydb.) -- Basal leaves all or mostly entire while the stem leaves are pinnatipartite. Flowers 2-3 mm long. Bracts eciliate. Pappus white. Late spring and early summer. Low, wet ground. -- seK-(Mack)-Y, NF, NB-BC, US.

Barely distinct from its eurasian counterpart, var. dioica, the latter being generally smaller and bearing \pm ciliolate bracts.

92. ADOXACEAE (MOSCHATEL FAMILY)

Stamens bifid to the base of the filament and thus seemingly twice as many as the corolla lobes. Floral parts variable in number: terminal flowers mostly with 2 sepals and 4 corolla lobes; lateral flowers mostly with 3 sepals and 5 corolla lobes.

1. ADOXA L.

MOSCHATTEL

Only genus and with a single species.

1. A. Moschatellina L. -- Moschatel, Townhall-Clock (Herbe musquée, Musquette) -- A small inconspicuous herb with a single pair of opposite and trifoliate stem leaves. Basal leaves more elaborately divided, often biternate. Flowers greenish and few in a small crowded cyme. Late spring and early summer. Deep woods, rare. -- Mack-Aka, wO-BC, US, Eur, (Afr).

Within our area we have checked specimens from Duck Mountain, Pasquia Hills, Candle Lake, Edmonton, Elk Island Park, Fort Saskatchewan, Widewater and Smith.

Order 51. SOLANALES

Flowers 5-merous, regular, the petals fused, the sepals fused and the carpels also fused into a superior ovary. Similar to the Gentianales but the leaves alternate and the ovary 2-(5)-locular.

- a. Fruit usually a berry; each carpel with more than 2 ovules 93. Solanaceae
- aa. Fruit a capsule with only 2 ovules in each carpel 94. Convolvulaceae

93. SOLANACEAE

(NIGHTSHADE FAMILY)

Usually readily recognized by the unusual position of the flowers or inflorescence and sometimes also the leaves. Such as the inflorescence being borne halfway up the internode, or opposite a leaf, etc.

- a. A shrub, often spiny 1. Lycium
- aa. Herbaceous. (Solanum Dulcamara is semi-shrubby).
 - b. Flowers very large; fruit a spiny capsule... 6. Datura
 - bb. Flowers much smaller, fruit rarely spiny.
 - c. Leaves alternate.
 - d. Flowers solitary and nearly opposite the leaves 2. Hyoscyamus
 - dd. Flowers in small panicles borne along the internodes 5. Solanum
 - cc. Upper leaves mostly in pairs, the smaller leaf arising from the axil of the other.
 - e. Flowers rotate, mostly in small glomerules 3. Chamaesaracha
 - ee. Flowers smaller, funelform, solitary 4. Physalis

1. LYCIUM L.

MATRIMONY-VINE

Corolla tubular. Calyx not enlarged in fruit. Shrubs.

1. L. HALIMIFOLIUM Miller -- Matrimony-Vine (Lyciet) -- A shrub, often spiny, climbing or scrambling, the leaves alter-

nate on the vigorous terminal shoots, fascicled on the shorter shoots and old wood. Flowers white, similarly solitary or fascicled. Leaves dimegueth, each fascicle with one leaf much larger than the other(s). Fruit a drooping, red berry. Summer. Rarely cultivated and exceptionally escaping to waste places: Edmonton. -- NS, O, cAlta-BC, US, Eur.

2. HYOSCYAMUS L.

HENBANE

Fruit a capsule opening by a terminal opercule.

1. H. NIGER L. -- Henbane (Tabac du diable, Jusquiamé) -- Flowers in terminal, spike-like and leafy inflorescences, with all the leaves to one side and subopposite to the flowers. Rather coarse, softly hirsute and glutinous. Flowers yellowish with conspicuous and reticulate purple veins. Calyx lobes spinescent in fruit. Summer. Infrequent poisonous weed of roadsides and waste places in wetter situations. -- NS-(PEI)-NB-Alta-(BC), US, Eur.

3. CHAMAESARACHA Gray

Quite close to Physalis, the calyx enclosing the berry at maturity, but tightly so. Flower rotate rather than funelform. Flowers mostly in axillary glomerules.

1. C. grandiflora (Hooker) Fern. (Leucophysalis grandiflora (Hooker) Rydb.; Physalis grandiflora Hooker) -- Flower large, white, with a yellow eye. Very glutinous annual. Upper leaves mostly in 2's as in Physalis. Flowers 2.5-4.0 cm across. Peduncles reflexed to pendent after flowering. Early summer. Sandy soils, mainly disturbed, especially around last year's campfires; rare and occurring singly or only a few plants at a time. -- Q-S, US.

4. PHYSALIS

GROUND-CHERRY

Calyx enlarging greatly in fruit and loosely enclosing the much smaller berry. Upper leaves mostly in 2's, the smaller leaf being borne in the axil of the larger one. Flower solitary and axillary.

- a. Peduncle 1-4 cm long; perennials.
 - b. Not glandular 3. P. virginiana
 - bb. Glandular and villous; generally larger 4. P. heterophylla
- aa. Shorter, about 0.5 mm at anthesis; annuals.
 - c. Stem glabrous 2. P. ixocarpa
 - cc. Densely villous 1. P. pubescens

1. P. PUBESCENS L. var. PUBESCENS (P. pruinosa AA.) -- (Batoto) -- Casual weed with an unusually large calyx, becoming 2.0-2.5 cm long in fruit, pale green, papery, ovoid. Annual with ovate or cordate and dentate leaves. Corolla yellow with 5 large purple patches. Second half of summer. Rare garden

weed: Winnipeg. -- NB-sMan, (BC), US, (CA), SA.

The more southerly and generally planicostal var. glabra (Mx.) Waterfall is glabrous or nearly so and its larger fruit is borne on a longer peduncle.

2. P. IXOCARPA Brotero -- Tomatillo -- Similar but glabrous or nearly so. Leaves smaller. Flower paler. Calyx purple along the main nerves. Late summer. Rare garden weed: Minto. -- Q-sMan, US, (CA), Eur.

3. P. virginiana Miller var. virginiana (P. viscosa AA.)-- Wild Ground-Cherry -- Stoloniferous native perennial with an inflated fruiting calyx as above. Rhizome deeply buried. Stem 1-4 dm high, puberulent to villous with spreading to retrorse hairs. Leaves up to 6 cm long, lanceolate to ovate. Fruiting calyx 2.5-4.5 cm long, green. Early summer. Light soils and a sand binder. -- swQ-sMan, US.

Native with us, but occurring mostly as a weed further east.

In the less widely distributed var. subglabrata (Mack. & Bush) Waterfall the herbage is glabrous or antrorse-pubescent.

4. P. HETEROPHYLLA Nees var. HETEROPHYLLA -- Wild Ground-Cherry (Cerise de terre sauvage) -- Taller, up to 1 m high and the pubescence partly long villous, partly shorter and glandular. Leaves broadly ovate, the main ones well over 6 cm long. Summer. Rare adventive collected at Winnipeg in 1857-58. -- (NS), Q-sMan, US.

Native further east. In the planicostal var. villosa Waterfall the villosity is still longer, the hairs 2-4 mm long.

5. SOLANUM L.

NIGHTSHADE

Anthers fused in a ring around the style. Filaments free. Inflorescence arising from the middle of the internode.

a. Very spiny 6. S. rostratum
aa. Not spiny.

b. Flowers blue; climbing by twining stem..1. S. Dulcamara

bb. Flowers white or yellow or pale mauve; non climbing.

c. Leaves pinnate 2. S. tuberosum
cc. Simple.

d. Leaves pinnatifid 3. S. triflorum
dd. Entire to dentate.

e. Stem and branches glabrous to appressed pubescent 4. S. nigrum

ee. Densely hirsute to glandular-hirsute 5. S. sarrachoides

1. S. DULCAMARA L. -- Bittersweet, Nightshade (Douce-amère, Vigne de Judée) -- Climber with blue flowers and yellow anthers. Semi-woody at base and sometimes merely erect and non-climbing. Leaves part entire, part tripartite with the terminal lobe many times wider than the lateral ones. Some inflorescences terminal, others internodal or opposite a leaf.

Berry red. Summer. Naturalized in disturbed bush; rare: Saint-Boniface, Morden. -- NF, NS-Man, BC, US, Eur.

The Edmonton report by Moss 1959, queried by Boivin 1966, is apparently to be discounted as there was no corresponding specimen at ALTA in 1969.

2. *S. TUBEROSUM* L. -- Potato (Patate, Pomme de terre) -- Leaves pinnate, the leaflets ovate, entire and dimegueth, the main ones irregularly alternating with some very much smaller ones. Flowers variable in color, sterile. Summer. Cultivated and casual on dumps and shores: Morden.--PEI-Q-(0)-Man, (US, SA).

3. *S. triflorum* Nutt. -- Wild Tomato -- A frequently weedy native with small internodal inflorescences. Annual, hirsute, branched from the base and usually sprawling. Leaves pinnatifid, the lobes entire. Berry green, on a sharply reflexed pedicel. Summer. Native on sand dunes and gopher holes, weedy or roadsides and cultivated fields, common. -- Q-BC, US.

Native in our area, a weed east and west of us.

4. *S. NIGRUM* L. var. *NIGRUM* (var. *virginicum* L.; *S. americanum* Miller; *S. interius* Rydb.) -- Wonderberry, Garden-Huckleberry (Tue-chien, Bluet de jardin) -- Many of the larger leaves with 2 much smaller leaves in the axil. Annual with fairly large ovate leaves. Flowers white, 3-7 in a subumbellate inflorescence. Calyx not enlarging in fruit, about 6 mm wide, merely spreading at the base of the black berry. Second half of summer. Rare garden weed. -- (Aka, NF), NS-(PEI)-NB-BC, (US), CA, SA, Eur, Afr.

Reputed to occur in America both as a weed (*S. nigrum*) and as a native (var. *virginicum* or *S. americanum*), the latter reputedly differing by some 5 or 6 characters. But these are not sharp enough for practical implementation of the distinction. Thus we have noticed some very small anthers on some american specimens, smaller than on any eurasian sheet examined. But the bulk of the american and of the eurasian specimens have anthers of about average length and the character is near useless. Remarks in a similar vein would also apply to the other alleged differences. There is however a more southern and better defined var. *Douglasii* (Duval) Gray, taller, larger-flowered and tending to perennity.

5. *S. SARRACHOIDES* Sendt. (*S. nigrum* var. *villosum* AA.; *S. villosum* AA.) -- Much as the above, but more pubescent. Calyx enlarging in fruit, covering the lower half of the yellowish green berry. Mid summer to early fall. Rare weed, mostly gardens. -- Aka, Q-BC, US, (SA).

6. *S. ROSTRATUM* Dunal (Androcera rostrata (Dunal) Rydb.)-- Buffalo-Bur, Kansas-Thistle -- Densely spiny throughout, including both faces of the leaves. Annual. Spines yellow, very sharp, the larger about 1 cm long. Flowers yellow. Calyx very spiny, enlarging in fruit and enclosing the berry. Late summer. Infrequent weed. -- (PEI), Q-Man-(S)-Alta-BC, US, (CA).

6. DATURA L.

THORN-APPLE

Fruit a spiny capsule.

SOLANUM

1. D. STRAMONIUM L. -- Stinkweed, Thorn-Apple (Pomme épineuse, Herbe aux sorciers) -- A very large white flower, 1 dm long or nearly so. Large annual with large and coarsely dentate leaves. Flower terminal or in the fork of 2 branches. Fruit very spiny. Mid to late summer. Rare and fleeting weed, but may appear in great quantity: Brandon, Melf., Edm.--NS-S-(Alta-BC), US, Eur -- F. TATULA (L.) Boivin -- Flowers mauve. Stem, etc., more or less purplish: Senlac. -- PEI-NB, O, S, US, Eur.

94. CONVULVULACEAE (CONVOLVULUS FAMILY)

Herbs climbing by twining stems. As in the Solanaceae but the ovules reduced to 2 in each carpel.

- a. Yellow parasites 1. Cuscuta
 aa. Green and merely climbing, not parasitic ... 2. Convolvulus

1. CUSCUTA L.

DODDER

Yellow parasitic vines. Root evanescent. Flowers in small clusters. Rather technical genus, our only species usually subdivided in a series of 4 or 5 microspecies.

1. C. Gronovii W. (C. arvensis Beyrich, var. calycina Eng.; C. campestris Yuncker; C. Cephalanthi Eng.; C. Coryli Eng.; C. curta (Eng.) Rydb.; C. megalocarpa Rydb.; C. planiflora AA.; C. pentagona Eng., var. calycina Eng.; C. umbrosa Hooker) -- Angel's Hair -- Forming a tangle of orange-yellow filiform stems and branches over the vegetation. Leaves lacking. Flowers small, yellowish. Mid summer. Mainly along shores and in bushy places, sometimes weedy, but uncommon. -- (NS-NB)-Q-Alta-BC, US, (CA, SA), Eur.

Our native C. Gronovii has long been segregated into an extensive series of microspecies based primarily of floral minutiae. It has never been obvious to us that any of the morphological types thus distinguished corresponded to a biological entity with a recognizably distinct behaviour and an individualized range.

As pointed out by Scoggan 1957, reports of C. Epilinum Weihe from our area have never been substantiated by herbarium specimens. As they cannot be subjected to the exercise of cartesian criticism, these reports have little scientific value, if any.

2. CONVULVULUS L.

BINDWEED

Green climbers by twining stems, with showy flowers.

- a. Flowers subtended by 2 large bracts enclosing the calyx 1. C. sepium
 aa. No such bracts 2. C. arvensis

1. C. sepium L. (f. coloratus Lange, var. americanus Sims, var. fraterniflorus Mack. & Bush, var. pubescens (Gray) Fern.; C. americanus (Sims) Greene; C. interior House) -- Morning-Glory,

Bindweed (Clochettes, Belles du matin) -- Climbing herb with large and showy white to pinkish flowers. Leaves triangular-hastate, entire. Flowers about 5 cm long, trumpet-shaped. Bracts \pm 2 cm long. Early to mid summer. Mainly at the edge of forests, sometimes spreading to, or persisting in, cultivated fields. -- NF-SPM, NS-BC, US, Eur, Oc.

While our plant is obviously native in America and also occurs as a planted and rarely escaped ornamental, we are not yet satisfied that there is a sound morphological basis for the separation of native from the introduced.

An old report by Macoun 1884 of C. spithameus L. from the banks of the Belly River has never been confirmed. It may have been based originally on a more pubescent specimen of C. sepium.

2. C. AVENSIS L. -- Small Bindweed, Field Bindweed (Petit Liseron, Vrillée) -- Smaller and the peduncle with a pair of small bracts near the middle. Flower 1.5-2.5 cm long. Mid summer. Waste places and cultivated field, often merely creeping on bare ground. -- NS-(PET)-NB-BC, US, CA, Eur.

Order 52. PERSONALES

Flowers zygomorphic. Sepals fused and petals fused. Carpels 2, fused, maturing into a capsule. Flower 5-merous, but the stamens only 2 or 4 and the corolla lobes often only 4 by the fusion of 2 of them.

- a. Plant parasitic, yellowish, brownish or purplish 96. Orobanchaceae, p. 32
- aa. Plants green.
 - b. Flower spurred.
 - c. Ovary unilocular; leaves all sub-merged or all basal... 97. Lentibulariaceae, p. 33
 - cc. Bilocular; terrestrial plants with a leafy stem 95. Scrophulariaceae, p. 10
 - bb. Not spurred.
 - d. Leaves very large and opposite; ovary unilocular 98. Martyniaceae, p. 35
 - dd. Alternate or opposite; ovary bilocular 95. Scrophulariaceae, p. 10

95. SCROPHULARIACEAE (FIGWORT FAMILY)

A major family of plants with a zygomorphic corolla of fused petals. Ovary bilocular and maturing into a capsule. Mostly with a square stem.

- a. Leaves all basal.
 - b. Scape one-flowered 10. Limosella
 - bb. Inflorescence a spike 13. Besseyia
- aa. Stem leafy.
 - c. Leaves whorled throughout 12. Veronicastrum
 - cc. Leaves alternate, or opposite, or some whorled.
 - d. At least the main stem leaves alternate Group A

- dd. At least the main stem leaves opposite (or whorled).
 - e. Calyx lobes 4 Group B
 - ee. Calyx lobes 5 or rarely 2.
 - f. Flower galeate, that is the corolla two-lipped and the upper lip much prolonged, its lobes obscure or reduced to small-teeth.
 - g. Leaves subentire 17. Melampyrum
 - gg. Deeply dissected 22. Pedicularis
 - ff. Corolla not galeate, the 5 lobes quite prominent Group C

Group A

Stem leaves present, all or mostly alternate.

- a. Corolla lacking or vestigial 13. Besseyia
- aa. Corolla present.
 - b. Flowers spurred.
 - c. Flowers in terminal racemes 2. Linaria
 - cc. Flowers axillary 3. Chaenorrhinum
 - bb. Not spurred.
 - d. Flower widely open and nearly regular 1. Verbascum
 - dd. Tubular and galeate.
 - e. Floral bracts petaloid and often more showy than the corolla 15. Castilleja
 - ee. Floral bracts green and smaller.
 - f. Calyx lobes 4; annual..... 16. Orthocarpus
 - ff. Calyx lobes 2 or 5; perennials 22. Pedicularis

Group B

Calyx lobes 4. Stem leaves all or mainly opposite.

- a. Corolla widely spreading 11. Veronica
- aa. Flower tubular and galeate.
 - b. Calyx somewhat inflated and narrowed at the throat, becoming very much inflated in fruit 21. Rhinanthus
 - bb. Neither inflated nor constricted at the throat.
 - c. Leaves short and palmately veined; flowers small 18. Euphrasia
 - cc. Leaves elongate and pinnately veined.
 - d. Corolla glabrous 17. Melampyrum
 - dd. Corolla pubescent or glandular.
 - e. Annual; flower \pm 1 cm long...19. Odontites

ee. Perennial; flower 1.2-1.7

cm long 20. Bartsia

Group C

Calyx and corolla with 5 obvious lobes, the corolla not galeate. Leaves all or mainly opposite.

- a. Flowers axillary, in the axils of leaves or bracts.
 - b. Calyx subtended by a pair of sepal-like bractlets 9. Gratiola
- bb. No accessory bractlets.
 - c. Upper leaves and flowers verticillate 4. Collinsia
- cc. Opposite.
 - d. Leaves serrate 8. Mimulus
 - dd. Entire 14. Agalinis
- aa. Inflorescence a panicle, raceme or spike.
 - e. A spike 6. Chelone
- ee. Panicle or raceme.
 - f. An open panicle 5. Scrophularia
 - ff. A raceme or a narrow racemiform panicle 7. Penstemon

1. VERBASCUM L.

MULLEIN

Flower nearly regular, 5-merous; the corolla rotate and with 5 distinct lobes. All 5 stamens present and fertile.

- a. Leaves petiolate 3. V. nigrum
- aa. Sessile.
 - b. Leaves long decurrent 1. V. Thapsus
 - bb. Not decurrent 2. V. phlomoides

1. V. THAPSUS L. -- Mullein, Wild Tobacco (Bouillon blanc, Semelles) -- The whole plant felty-tomentose. Stiffly virgate herb with a dense terminal spike of yellow flowers. Leaves gradually shorter above, oblanceolate, long cuneate into a decurrent base. Flowers less than 2 cm across. Filaments of the upper stamens long pilose with white hairs. After mid summer. Rare weed of waste places: Killarney, Saskatoon, Burmis and Pincher -- NF, NS-(PEI)-NB-BC, US, SA, Eur.

2. V. PHLOMOIDES L. -- Woolly Mullein (Cierge de Notre-Dame, Herbe de Saint-Pierre) -- Similar, the pubescence not quite so heavy. Leaves merely cordate and clasping at base, not decurrent. Flowers larger, 3-6 cm wide. All summer. Rare railway or garden weed: Moose Jaw, Fort Saskatchewan. -- PEI, Q-O, S-BC, neUS, Eur.

The Moose Jaw collection was originally reported in the Blue Jay 20: 84. June 1962 as V. Thapsus (REG).

3. V. NIGRUM L. (V. virgatum AA.) -- Black Mullein (Bouillon noir, Cierge) -- Pubescence not felty. Leaves rounded to cordate at base. Flowers 1.5-2.0 cm across. Filaments long

pilose with purplish hairs. Mid to late summer. Rare roadside weed: Fort Saskatchewan. -- O, Alta, (US), Eur.

2. *LINARIA* Miller

TOAD-FLAX

Corolla prolonged into a conspicuous spur on the lower side. Flowers in terminal racemes.

- a. Flowers yellow and orange.
 - b. Leaves linear and narrow 1. L. vulgaris
 - bb. Broader, the main ones at least
 - 1 cm wide 4. L. dalmatica
- aa. Flowers white, mauve, pink, purple, etc., but not yellow.
 - c. Peduncle 2-4 mm long 2. L. canadensis
 - cc. 5 mm or more; flower bicolour 3. L. maroccana

1. L. VULGARIS Hill -- Toadflax, Butter-and-Eggs (Gueule de lion, Gueule de lion des champs) -- Spurred, yellow flower with an orange cushion on the lower lip. Glabrous and green perennial. Leaves linear. Flowers 2-3 cm long. Summer. Uncommon but much collected weed, originally introduced as an ornamental. -- Mack, Aka, NF-SPM, NS-BC, US, Eur.

2. L. CANADENSIS (L.) Dumont var. TEXANA (Scheele) Pennell (L. texana Scheele) -- Usually producing sterile basal shoots with shorter and opposite or verticillate leaves. Thin virgate annual with linear leaves. Flower 1.5-2.5 cm long, bluish. Summer. Rare and evanescent adventive: Alsask, Man-
rengo. -- S, swBC, US, (CA).

The typical and more eastern phase is generally smaller, the flowers paler and commonly only half as long.

An old Canadian report of Tonella collinsioides Nutt. by Macoun 1878 was without locality or other data and was ignored by later authors, even by Macoun himself in his later papers. It was apparently based on a collection since revised to L. canadensis (MTMG)

3. L. MAROCCANA Hooker f. (L. reticulata AA.) -- Branchy annual with variable flower colour; commonly pinkish to purplish with a yellow throat. Leaves narrow, linear. Late summer. Ornamental rarely reseeding itself around gardens: Beaverlodge. -- PEI, nwAlta-neBC, (US, Afr).

4. L. DALMATICA (L.) Miller var. DALMATICA -- Similar to L. vulgaris but larger and glaucous. Commonly 1 m high. Leaves ovate to broadly lanceolate, rounded to cordate at base, over 1 cm wide. Flowers 3-4 cm long. Second half of summer. Currently popular ornamental, spreading to roadsides, ditches, etc. -- (NS), Q-BC, US, Eur.

There is also in Macedonia a geographically restricted var. macedonica (Gris) Vandas with smaller flowers on longer pedicels.

3. CHAENORRHINUM Reichenbach

Flowers solitary in the leaf axils. Otherwise as in Lina-
ria.

1. C. MINUS (L.) Lange -- Flower spurred, small, bluish and glandular-pubescent. Small annual, glandular-pubescent throughout. Leaves linear. Fruit also glandular-pubescent. Summer. Along railway tracks. -- NS-BC, US, Eur.

4. COLLINSIA Nutt.

Lower lobe of the corolla more or less saccate and enclosing the 4 stamens. Corolla bilabiate.

1. C. parviflora Lindley -- Blue Lips -- Small annual with the lower leaves opposite, the upper leaves and flowers verticillate. Leaves \pm lanceolate, entire. Flower small, blue, solitary, on an elongate peduncle. Late spring and early summer. Hillsides and shale slopes, local: southeastern Manitoba, Cypress Hills and Rockies. -- Y-(Aka), O-BC, US.

5. SCROPHULARIA L.

FIGWORT

A basic type with a bilabiate flower but neither spurred nor galeate. Normal stamens 4, with a vestigial fifth.

1. S. LANCEOLATA Pursh (S. leporella Bickn.) -- (Herbe du siège) -- Flowers in a narrow panicle of pedunculate cymes. Tall virgate herb, 1-2 m high. Stem strongly squarish. Leaves opposite, broadly lanceolate, serrate. Inflorescence with very small bracts. Flower greenish purple. (First half of summer?). Rare railway introduction: Mortlach. -- (NS, NB)-Q-O, sS, (BC), US.

6. CHELONE L.

Calyx of 5 free sepals and closely subtended by a calyculule of 2-(3) large sepal-like bracts. Flower bilabiate, with 4 perfect stamens and a fifth sterile and shorter.

1. C. glabra L. var. linifolia Coleman -- Turtlehead, Balmoney (Tête de tortue, La Tortue) -- Rather large white bilabiate flowers in a terminal spike. Around 1 m high. Leaves linear. Flower 2-3 cm long. Late summer. Marshy places: Elma. -- O-seMan, US.

Leaves 1-2 cm wide, the upper gradually somewhat smaller. In the typical and eastern variety the leaves are isomegueth and somewhat larger, lanceolate and mostly 2-3 cm wide.

7. PENSTEMON Mitchell

BEARD-TONGUE

Stamens 5, of which one is sterile, as in Chelone, but the genus otherwise more typical of the family, the calyx of fused sepals and lacking a calyculule. Flower bilabiate, usually large and showy.

- a. Flower short, (6)-10-(12) mm long.
 - b. Flower blue 7. P. procerus
 - bb. White, drying yellow 8. P. confertus
- aa. Longer.
 - c. Decumbent alpine shrubs; flowers opposite in a simple raceme.
 - d. Leaves ovate to elliptic 5. P. Davidsonii
 - dd. Taller; the leaves broadly to narrowly lanceolate 4. P. fruticosus
 - cc. Herbs, erect or nearly so; flowers clustered to narrowly paniculate.
 - e. Style exserted and conspicuously long-pilose in yellow 3. P. eriantherus
 - ee. Included and mostly not yellow-pilose.
 - f. Flowers 3-4 cm long 6. P. Lyallii
 - ff. Flowers about 2 cm long.
 - g. Corolla glabrous externally.
 - h. Lower inflorescence bracts suborbicular 2. P. nitidus
 - hh. Lanceolate 9. P. albertinus
 - gg. Glandular-puberulent.
 - i. Flowers white; plant densely glandular-puberulent throughout... 1. P. albidus
 - ii. Mauve; plant gradually less puberulent below and at least the lower and basal leaves glabrous..10. P. gracilis

1. P. albidus Nutt. -- Flowers white with a few purple lines, drying dirty gray or blackish. Herbage densely glandular-puberulent throughout. Corolla about 2 cm long, the tube gradually flaring, the lobes widely spreading, sometimes tinged pink. Late spring and early summer. Steppes and hillsides.-- swMan-sAlta, US.

2. P. nitidus Douglas var. nitidus (P. acuminatus AA.)-- Herbage heavily glaucous and the leaves somewhat fleshy. 1-3 dm high and glabrous. Leaves mainly ovate, entire. Flowers blue, about 2 cm long or slightly less. Late spring and early summer. Dry hillsides. -- swMan-seBC, US.

Grades into a more southern var. polyphyllus (Pennell) Cronq. with narrower leaves and bracts, ovate-lanceolate to lanceolate.

3. P. eriantherus Pursh var. eriantherus (P. cristatus Nutt.; P. erianthera sphalm.; P. puberulentus AA.) -- Style exserted and conspicuously pilose with yellow hairs 2-4 mm long. Herbage hirsute and glandular-puberulent throughout. Corolla 2-3 cm long, abruptly narrowed towards the middle, narrowly tubular below, nearly campanulate above, glandular-puberulent on the outside, mauve to magenta or purplish blue, tending to dry brownish. Early summer. Rocky foothill prairies. -- swAlta-seBC, WUS.

In the typical phase the glomerules are \pm overlapping and the anther sacs are squarish or transversely oblong. In the north-western U.S.A. there occur var. Whitedii (Piper) Nelson and var. argillosus M.E. Jones with a longer and moniliform inflorescence, the glomerules being distant, and oblong anthers.

Reports of P. puberulentus from Estevan were based on a sheet of P. albidus: W.P. Fraser, Estevan, June 26, 1917 (SASK).

4. P. fruticosus (Pursh) Greene (var. Scouleri (Douglas) Cronq.) -- Huge blue to mauve flowers, opposite in a terminal raceme. Decumbent shrub with erect herbaceous shoots 1-4 dm high. Leaves \pm lanceolate, serrate, thickish. Flower tubular, 3-5 cm long. Late spring and early summer. Rocky outcrops in the mountains. -- swAlta-sBC, nwUS.

5. P. Davidsonii Greene var. ellipticus (Coult. & Fisch.) Boivin (P. ellipticus Coult. & Fisch.) -- Similar, more depressed and lower, with wider leaves and often smaller flowers. Erect shoots (0.5)-1.0-(1.5) dm high. Leaves ovate to elliptic, about 1 cm wide, remotely toothed. Flowers 3-4 cm long. Summer. Alpine summits and shale slides. -- swAlta-seBC, nwUS.

The leaves are entire and clearly obovate in the more western typical variety.

6. P. Lyallii Gray -- Large flowers resembling the above two, but the inflorescence slightly branched, the lower flowers being borne in cymes or umbels of 2-4 flowers. Tufted herb, the stems 3-5 dm high. Leaves narrowly lanceolate, 4-8 cm long, distantly serrate. Early summer. Rocky montane slopes. -- swAlta-seBC, nwUS.

7. P. procerus Douglas var. procerus -- Blue tubular flower 1 cm long or slightly less. Leaves narrowly lanceolate, entire. Flowers spreading to descending, tending to be in 1-2-(3) clusters. Calyx lobes cuspidate, the margin membranous and erose. Early summer. Common on moister prairies. -- Y-(Aka), swMan-BC, nwUS -- F. Jenkinsii Boivin -- Flowers pink. Hoosier. -- swS.

Grades further south into a var. formosus (Nelson) Cronq. with shorter calyx, 1.5 - 3.0 mm long.

8. P. confertus Douglas -- Flowers white, fading and drying yellow. Otherwise almost identical with the last, but perhaps a bit larger throughout, and later flowering by about 4 weeks. Montane prairies and hillside draws in the steppe; adventive at Swift Current and Devil's Lake. -- swS-swAlta-seBC, US.

9. P. albertinus Greene (P. virens Pennell) -- Calyx smallest, 2.5-4.0 mm long. Leaves \pm lanceolate, entire to remotely serrulate towards the tip. Glabrous, but the stem puberulent. Flowers 1.5-2.0 cm long, blue, glabrous. First half of summer. Semi-open places at middle altitudes: Waterton -- swAlta-seBC, swUS.

Alberta and B.C. were included in the range of P. pseudohumilis Rydb. as given by Rydberg 1917. This species appears to range entirely south of the 49th parallel, there were no

Canadian sheets at NY in 1965, and the only Alberta sheet located, Macoun 24177, Crow Nest Lake, July 31, 1887 (CAN; DAO, photo), was subsequently revised to P. albertinus. The same also applies to the B.C. sheets, including those identified P. humilis Nutt., another more southern species also confused by some Canadian authors with P. pseudohumilis and P. albertinus. Reports by Macoun 1884 of P. glaucus Graham for the same areas were also based on P. albertinus and his Mackenzie report is similarly rated as improbable, even if its actual basis was not ascertained. The latter was supposedly a sheet at MTMG, but we noted no Mackenzie sheet of Penstemon in our 1963 survey of that collection.

10. P. gracilis Nutt. var. gracilis -- Light blue tubular flowers about 2 cm long. Leaves thickish, narrowly lanceolate, remotely serrulate. Glandular-puberulent in the inflorescence, glabrous below. Early summer. Frequent and showy prairie species. -- wO-neBC, US -- F. Scogganii Boivin -- Flowers white. Local: Lily Pond, Nipawin. -- seman-S.

F. Scogganii f.n., floribus albis in vivo. Type: Boivin & Laishley 13092, Réserve Forestière Whiteshell, falaise au bord du Lily Pond à l'ouest du lac Caddy, fleurs blanches, croissant avec la forme typique, 26 juin 1959 (DAO). Dr. Homer J. Scoggan is the author of an excellent Flora of Manitoba.

Known only from a limited area in Wisconsin, var. wisconsinensis (Pennell) Fassett is puberulent throughout.

Re P. Richardsonii Douglas reported from Alberta by Rydberg 1917, see comment under Rosa blanda, part I, page 68. A similar range given by Eastham 1947 was presumably based on Rydberg's.

8. MIMULUS L.

MONKEY-FLOWER

Calyx strongly angular. A basic and unspecialized type with 5-merous and ± bilabiate axillary flowers. Stamens 4.

a. Flowers blue 1. M. ringens
aa. Magenta or yellow.

b. Flowers magenta 5. M. Lewisii
bb. Yellow.

c. Calyx symmetrical 4. M. floribundus
cc. Bilabiate, the lateral lobes shorter.

d. Calyx almost truncate at mouth,
the lateral and lower lobes less
than 0.5 mm long 3. M. glabratus

dd. Lobes broadly deltoid, the lower
mostly 2-3 mm long 2. M. guttatus

1. M. ringens L. var. ringens -- Monkey - Flower -- A square-stemmed herb with large blue flowers. Leaves lanceolate, sessile, clasping at base, subentire to weakly serrate. Flower 2-3 cm long. First half of summer. Wet shores, rare. -- NS-ecS, US.

We know of two Saskatchewan collections: Hudson Bay Junction (DAO) and Armit (DAO), about 25 miles to the east of the

first. Another collection is labelled T.J.W. Burgess, South Antler Creek, July 29, 1873 (MTMG; DAO, photo). Not yet confirmed by a modern collection. In so far as the Gainsborough (or South Antler) Creek crosses borders repeatedly, it is not clear if this 1873 collection should be credited to southeastern Saskatchewan, or southwestern Manitoba, or north-central North Dakota. It may occur in all three units and is, at any rate, a range extension.

In the estuaries of the Saint Lawrence and Penobscot rivers it is replaced by the generally smaller var. colpophilus Fern., the stem, internodes, leaves peduncles and calices shorter.

2. M. guttatus DC. (M. Tilingii Regel) -- Monkey-Flower -- Yellow flower punctate in maroon and densely pilose in yellow at the throat. Highly variable. Leaves ovate, dentate, more or less parallel-nerved. Flowers 1-4 cm long. Calyx sometimes purple-dotted. Mid summer. Mountain creeks and wet places: Cypress Hills, Rockies. -- sY-Aka, swS-BC, US, (CA, Eur).

3. M. glabratus HBK. var. glabratus (var. Fremontii (Benth.) Grant, var. Jamesii (T. & G.) Gray; M. Geyeri Torrey) -- Like a small version of the above. Glabrous or nearly so. Flowers 9-14 mm long. Calyx very shallowly crenate at throat, the calyx lobes otherwise not obvious. Summer. Near springs, rare or overlooked: Whitewood and Agassiz Delta. -- Q-scManseS, US, (CA).

Vicariant of the South American var. micranthus (Phil.) stat. n. (M. luteus var. micranthus Phil.; Linnaea 29: 28-1857-8; M. glabratus var. parviflorus (Lindley) Grant 1924) with abundant pubescence in the inflorescence.

4. M. floribundus Douglas -- Small annual, the calyx lobes all similar and acutish. Leaves ovate, petiolate. Calyx less than 1 cm long. Corolla 8-15 mm long. Early summer. Wet ledges of cliffs: Hillcrest. -- swAlta-sBC, wUS, (CA).

5. M. Lewisii Pursh -- Large magenta flowers 3-5 cm long. Herbage glandular-pubescent and villous. Leaves sessile, ovate to lanceolate, parallel-nerved. Peduncles elongate, at least as long as the flower. Calyx purplish. Mid summer. Along mountain brooks in Waterton. -- (seAka), swAlta-BC, wUS.

9. GRATIOLE L.

HEDGE-HYSSOP

Calyx subtended by a pair of bracts similar to the calyx lobes and thus sometimes appearing as if the calyx had 7 lobes.

1. G. neglecta Torrey var. neglecta (G. virginiana AA.) -- (Herbe à pauvre homme) -- Small annual with yellow flowers and a rather thickish stem. Densely glandular-puberulent throughout. Leaves lanceolate, entire or nearly so. Peduncle nearly as long as the subtending leaf. Flower about 1 cm long. Early summer to early frosts. Dried up ponds and around small sloughs. -- NS, swQ-BC, US.

Var. glaberrima Fern. from the tidal flats of the Saint Lawrence river is glabrous throughout.

10. LIMOSELLA L.

MUDWORT

Corolla nearly regular, 5-merous, small. Anthers 4, unilocular.

- a. Some of the leaves with a distinct limb ... 1. L. aquatica
 aa. Leaves all filiform 2. L. subulata

1. L. aquatica L. -- Mudwort -- Small herb spreading by superficial stolons and forming a tangled carpet. Leaves very variable, entire, some of them reduced to the petiole. Flower purplish, basal, on peduncles arching in fruit. Early summer to early frosts. Mud flats, sometimes submerged. -- (G), K-(Mack-Aka), L-(NF), Q-BC, US, Eur.

2. L. subulata Ives -- Generally smaller and the leaves filiform, less than 0.5 wide. Flowers usually white. (Late spring?) Flats of saline sloughs; rare or overlooked: Granum, Ponoka. -- seNF, NS-sQ, sAlta neUS, Eur.

11. VERONICA L.

Flower 4-merous and only slightly asymmetrical, the corolla more or less spreading. Stamens only 2. Leaves opposite, but the floral bracts mostly alternate.

- a. Calyx with 2 long lobes and 3 shorter ones ..
 8. V. latifolia
 aa. Calyx lobes 4.
 b. Flowers all in axillary and opposite racemes,
 the main axis ending in a sterile shoot.
 c. Leaves abruptly contracted at base to a
 petiole less than 1 cm long.
 d. Leaves glabrous, oblong-lanceolate ..
 10. V. americana
 dd. Villous, deltoid-ovate 9. V. Chamaedrys
 cc. Leaves sessile.
 e. Leaves lanceolate, clasping at
 base 11. V. comosa
 ee. Leaves linear, cuneate at base ..
 12. V. scutellata
 bb. Flowers solitary or in terminal racemes.
 f. Flowers all solitary in the axils of
 alternate leaves; pedicels elongate.
 g. Capsule pubescent near the edge
 only, glabrous or nearly so on
 the faces 7. V. persica
 gg. Capsule equally puberulent or
 glandular-puberulent over the
 whole surface.
 h. Style 1 mm long or less and
 overtopped by the shoulders
 of the fruit 5. V. agrestis
 hh. Longer, 1.0-1.5 mm long and
 overtopping the shoulders

- of the fruit 6. V. polita
 ff. Flowers all or mostly in a terminal raceme,
 the bracts alternate.
 i. Leaves 4-12 cm long, narrowly lanceolate 1. V. longifolia
 ii. Much shorter.
 j. Leaves gradually passing into the inflorescence bracts...4. V. peregrina
 jj. Inflorescence well defined, the bracts many times shorter than the opposite leaves.
 k. All leaves sessile 2. V. alpina
 kk. Lower ones abruptly contracted into a short petiole 3. V. serpyllifolia

1. V. LONGIFOLIA L. var. LONGIFOLIA -- A tall virgate herb with opposite leaves and one (or more) dense terminal racemes of blue flowers. Densely puberulent throughout. Leaves serrate, broadly rounded to truncate at base. Flower with a distinct tube about 3 mm long. Mid summer. Infrequently escaped ornamental: Rutland, Le Pas. -- (NF), NS-(PEI)-NB-S, neUS, (Eur).

In the typical phase the leaves are generally 1-2 cm wide, lanceolate to narrowly lanceolate, cuneate to subcordate at base, while the central european var. Bachofenii (Heuffel) stat. n. (V. Bachofenii Heuffel, Flora 18: 253. 1835) has larger leaves, 2-4 cm wide, triangular-lanceolate, the middle and lower ones deeply cordate at base.

2. V. alpina L. var. unalaschcensis C. & S. -- Capsule longer, 4-6 mm long. Small erect native, 1-2 dm high, with 4-6 pairs of ovate to lanceolate sessile leaves, and a terminal raceme of blue flowers. Glandular-puberulent throughout. Leaves entire. Sepals 3-4 mm long. Style 1.0-1.5 mm long. Capsule obovate. Mid summer. Near mountain streams. -- G, (K-Mack)-Y-Aka, L, Q, wAlta-BC, US, (Eur).

In the more western var. nutans (Bong.) Boivin the leaves are ± serrulate and ± ovate.

3. V. serpyllifolia L. var. humifusa (Dickson) Vahl (V. tenella All.) -- Quite similar to the above. Stem incurved-puberulent, becoming somewhat glandular in the inflorescence. Sepals smaller and shorter than the style. Capsule half as long as wide, obreniform. Late spring and early summer. Wet montane meadows: Cypress and Rockies. -- sAka, L-(NF, NS), NB-O, swS-BC, US, (CA, SA, Eur).

Often introduced east of us, the eurasian var. serpyllifolia is appressed-puberulent and not glandular on the rachis and pedicels.

4. V. peregrina L. var. xalapensis (HBK.) St. John. & Warren (V. xalapensis HBK.) -- Neckweed -- Inflorescence not well defined. Lower leaves opposite and sterile, gradually passing into a bracteate raceme of alternate flowers. Glandular-

puberulent throughout. Leaves smallest, mostly linear and less than 4 mm wide. Styles 0.1-0.2 mm long. Summer. Frequent in ~~exsiccated~~ places. -- sMack-Aka, NB-BC, US, (CA, SA), Oc.

Occurring both east and west of us, var. peregrina is glabrous.

5. *V. AGRESTIS* L. -- Winter-Weed -- Much like the next. Sepals at first lanceolate, becoming ovate-lanceolate and 5-8 mm long in fruit. Capsule somewhat bigger, \pm 4 mm long. Summer. Rare garden weed: Beaverlodge. -- NF-(SPM), NS, NB-O, Alta-(BC, US), Eur, (Afr).

The inclusion of Manitoba in the range of *V. agrestis* by Montgomery 1954 may have been based on a collection since revised to *V. polita*, namely; Boivin & Mosquin 11045, Aweme, jardin de Stuart Criddle, 24 juillet 1955 (DAO).

6. *V. POLITA* Fries -- Similar to the following, but generally somewhat smaller. Peduncle about 1 cm long, becoming strongly recurved in fruit. Sepals broadly ovate, elongating to 4-5 mm in fruit. Style 1.0-1.5 mm long. Capsule obreniform, \pm 3 mm long, each half elliptic and rounded on the shoulder. Summer and fall. Rare garden weed: Cartwright, Aweme. -- O-sMan, US, (CA, SA), Eur, (Afr).

7. *V. PERSICA* Poiret var. *ASCHERSONIANA* (Lehm.) Boivin (*V. Tournefortii* AA.) -- Bird's Eye, Cat's Eye -- Annual herb with the lower leaves opposite and sterile, the upper alternate and subtending solitary flowers. Peduncle longer than the subtending leaf, ascending, becoming recurved under the fruit. Flower blue, the lower lobe smaller and white. Style 2.0-2.5 mm long. Each half of the capsule rhomboid with an angular shoulder. Summer. Garden weed. -- Q-O, Alta-BC, (Eur).

All four lobes are blue in var. Corrensiana (Lehm.) Boivin, also introduced in North America.

Specimens seen from Manitoba and Saskatchewan could not be determined variately.

8. *V. LATIFOLIA* L. (*V. Teucrium* L.; *V. longifolia* AA.) -- Hungarian Speedwell (*Teucrlette*) -- With a few stiffly erect subterminal racemes. Erect virgate perennial with the racemes overtopping the sterile terminal shoot. Late spring to early summer. Rare escape to open prairies: Raymore. -- O, S, US, Eur.

A variable and much subdivided species. We have not been able to determine our specimens beyond the specific level.

Our plant is often called *V. Teucrium* because *V. latifolia* L. 1753 has been variously interpreted now in the sense of *V. Teucrium* L. 1762 sensu lato, now in the sense of *V. urticifolia* Jacq. 1773 (vel sphalmate *V. urticaefolia*). The situation was briefly reviewed and discussed by Pennell 1935. We agree with Pennell and further we find it would be difficult to typify *V. latifolia* in the sense of *V. urticifolia*. The latter is represented in the linnean herbarium by only one sheet, no. 26.55, which was part of a shipment from Jacquin to Linné in 1768, hence is not available to typify either linnean entity. On the other hand there are many sheets of the *V. Teucrium* kind, and

the main one seems to be sheet 26.52 identified latifolia 19 by Linné. 19 is the number of V. latifolia in the first edition of the Species Plantarum and the sheet also bears on the back in the hand of Linné the name used in the Hortus Cliffortianus and cited as the first synonym under V. latifolia in 1753. Apparently this sheet 26.52 came from the Hortus Cliffortianus, it is the central element of the linnean concept of V. latifolia and must stand as its type specimen.

It does not appear that Linné was aware of V. urticifolia as another concept until 1768 when he received a sheet from Jacquin. Further, when V. Teucrium was created in 1762, the earlier V. latifolia was not modified by Linné; V. Teucrium was proposed as an entirely new entity rather than as a segregate of V. latifolia. V. Teucrium may have been based entirely on literature references as there seems to be no obvious type or syntype in the Linnean collection.

Therefore we see no reason to reject V. latifolia in favour of V. Teucrium and we do not accept Kerner's contention published in Oest. Bot. Zeit. 23: 367, 1873 and still accepted by some authors that V. urticifolia should be called V. latifolia.

9. V. CHAMAEDRYIS L. -- Bird's Eye, Angel's Eye (Herbe à Thérèse, Petit chène) -- Leaves deltoid-ovate and the flowers in elongated axillary racemes, like the next few. Herbage pilose and the stem heavily pilose along 2 lines on the internodes. Petioles very short. Style 4-5 mm long. First half of summer. Uncommon garden weed: Banff. -- (Aka), NF, NS-O, swAlta-BC, US, Eur.

10. V. americana Schwein. (vel sphalm. (Raf.) Schwein.) -- Brooklime, Wallink -- A soft herb of wet places, with axillary racemes and lilac flowers drying blue. Leaves 2-6 cm long, oblong-lanceolate, crenately serrate, short petiolate. Early to mid summer. Wet places flooded in spring. -- Mack-Aka, NF, NS-BC, US, (CA, eEur).

11. V. comosa Richter var. glaberrima (Pennell) Boivin (V. catenata Pennell; V. connata Raf. ssp. glaberrima Pennell; V. salina AA.) -- Similar but the shorter leaves sessile and clasping at base. Glabrous. Flowers white to pink. Fruit more or less emarginate. Summer. Springs and creeks. -- sMan-Alta, US, Eur -- Var. glandulosa (Farwell) Boivin -- Glandular in the inflorescence. -- swQ-sMan-swS (Cypress Hills), US.

12. V. scutellata L. -- Marsh Speedwell -- Similar to the above two, but the leaves long and narrow, often ribbon-like, commonly less than 5 mm wide. Glabrous. Racemes ± secund. Flowers lavender. Fruit obreniform. Summer. Grassy shores of marshes and creeks. -- Mack-Y, L-SPM, NS-BC, US, Eur -- F. villosa (Schum.) Pennell -- Puberulent, especially along the stem. -- (sMack-Y, Q)-O-(Man)-S-BC, Eur -- F. alba Boivin -- Flowers white. Lake Sasaginnigak. -- Man.

12. VERONICASTRUM Fabricius CULVER'S ROOT

Corolla tubular. Otherwise as in Veronica, the corolla with 4 lobes and the stamens 2, but the calyx lobes 4 or 5.

1. V. virginicum (L.) Farw. var. virginicum -- Culver's Root, Culver's Physic -- Generally resembling Veronica longifolia, but the flowers white and the leaves verticillate, cuneate at base. Mid summer. Grassy shores and ditches, rare: Arnaud. -- (NS), O-sMan, US.

The asiatic vicariant, var. sibiricum (L.) stat. ^{n.v.}, Veronica sibirica L., Sp. Pl. ed 2, 1:12, 1762, has a somewhat longer corolla, ca 5 mm, and the lobes of the calyx are a little narrower.

Also known as: Herbe à quatre feuilles.

13. BESSEYA Rydb.

KITTEN-TAILS

Stamens only 2 and the fruit a capsule as in Veronica. But the corolla lacking and the sepals fused most of their length.

1. B. wyomingensis (Nelson) Rydb. (B. cinerea AA.) -- With somewhat the habit of a Plantago. Lanate-villous throughout. Leaves dimegueth, the basal ones ovate, crenate, the stem-ones many times smaller. Spike dense. Calyx reduced to a bract with 2-(3) lobes at tip, standing on the outside like an accessory bract. Stamens red. Late spring and early summer. Open hillsides in the mountains: Cypress, Rockies. -- swS-Alta, US.

14. AGALINIS Rafinesque

Stigmas 2. Flower \pm campanulate, slightly bilabiate, 5-merous, but with only 4 stamens.

a. Peduncle 5 mm long or less 2. A. purpurea
aa. Much longer.

b. Corolla (1.8)-2.0-2.5 cm long 1. A. aspera

bb. Corolla 1.0-1.5 cm long 3. A. tenuifolia

1. A. aspera (Douglas) Britton (Gerardia aspera Douglas) -- A rather thin annual with large pink flowers on long axillary peduncles. Leaves linear, very strongly scabrous above. Peduncle somewhat shorter than the flower. Calyx lobes 1.5-3.0 mm long. Corolla densely puberulent on the tube but the lobes merely ciliate. Second half of summer. Wet places exundated late in the season, rare: Emerson, Stony Mountain, Pembina Hills. -- sMan, cUS.

2. A. purpurea (L.) Pennell var. parviflora (Bentham) Boivin (Gerardia paupercula (Gray) Britton, ssp. borealis Pennell) -- Peduncles short, shorter than the calyx. Otherwise much as the above. Corolla 1-2 cm long, densely puberulent throughout, sometimes obscurely so. Calyx lobes 2.0-3.5 mm long. Late summer. Exundated places. Reported for Stony Mountain. -- NS, Q-O-(sMan), nUS.

Stat. n., Gerardia purpurea L., var. parviflora Bentham, Comp. Bot. Mag. 1: 208. 1836.

Our variety has the leaves 1.0-2.5 mm wide while the panicostal var. racemulosa (Pennell) stat. n., Gerardia racemulosa

Pennell, *Torreya* 11: 15. 1911, has filiform leaves, 1 mm wide or less, the calyx lobes shorter, 1-2 mm long, and the corollas larger, 2.0-3.5 cm long.

See also Additions and Corrections.

3. *A. tenuifolia* (Vahl) Raf. var. *parviflora* (Nutt.) Pennell (*G. tenuifolia* Vahl var. *parviflora* Nutt.) -- Flowers smaller. Peduncle about as long to somewhat longer than its flower. Calyx lobes (0.7)-1.0-(1.5) mm long. Corolla puberulent like the last. Late summer. Exundated places, rare: Lake of the Woods, Dugal's Ditch, Lettonia. -- swQ-seMan, US.

15. CASTILLEJA Mutis

PAINTED CUP

Very showy herbs because the floral leaves tend to take on the color of flowers. Calyx green or petaloid. As the flowers are axillary in the upper part of the stem, the whole of the inflorescence thus becomes petaloid. Corolla elongate and strongly galeate. Calyx divided into 2 main lobes, each of which is usually bilobed again. Perennial herbs with alternate leaves, rarely annual, but then the corolla much elongated. Leaves sometimes entire, but more typically the upper leaves and especially the floral leaves digitately lobed at tip to pinnatipartite in the upper half. Our species not always clear cut.

a. Annual 1. *C. coccinea*
aa. Perennial.

b. Flowers 4.0-5.5 cm long 2. *C. sessiliflora*
bb. Shorter and more ascending.

c. Flowers dull pink or mauve to dull
violet, drying dark violet 5. *C. Raupii*
cc. White or yellow to bright red.

d. Upper leaves entire, becoming coarsely
trilobed in the inflorescence.

e. Bracts reddish or scarlet at
tip 8. *C. miniata*
ee. Whitish or yellow.

f. Bracts white or yellowish or
pinkish tinged; flowers \pm 2 cm
long 6. *C. pallida*

ff. Yellow; flowers usually
longer.

g. Calyx lobes broadly
rounded 7. *C. occidentalis*

gg. Acute and more or less
lanceolate 4. *C. lutescens*

dd. Upper leaves deeply divided at tip
into 3-5 lobes, the lateral ones
narrowly linear.

h. Inflorescence bright red or
scarlet 9. *C. hispida*

hh. Yellow.

- i. Calyx lobes broadly rounded 3. C. Cusickii
 ii. Acute 4. C. lutescens

1. C. coccinea (L.) Sprengel -- Fire Pink, Red Indians -- Shallowly rooted annual, 2-4 dm high. Stiffly erect and usually simple. Upper stem leaves with 3-5 linear lobes. Inflorescence white or yellow or typically scarlet. Secondary lobes of the calyx poorly developed or often lacking, the primary lobes being broadly truncate at tip. Flower 2.0-2.5-(3.0) cm long. Early summer. Grassy openings, dry or wet. -- O-sMan-seS, US.

The only Saskatchewan collection is from Buchanan (SASK).

It was made half a century ago by one Mrs. F. P. Henwood and has never been confirmed.

2. C. sessiliflora Pursh -- Honeysuckle -- Flower longest, whitish, strongly falcate and often spreading at tip. Tufted perennial usually less than 2 dm high at flowering. Stem leaves narrowly trilobed. Bracts mostly green. Calyx with 4 linear lobes. Late spring and early summer. Hillsides, especially along coulees. -- swMan-sS, cUS -- F. purpurina Pennell -- Flower pink, salmon or purple. Rare: Melita. -- swMan, (US).

3. C. Cusickii Greenman (C. lutea Heller) -- Inflorescence yellowish and the narrow leaves all, or at least the upper, deeply divided into narrow lobes. Tufted and 1-3 dm high, densely puberulent and villous. Early summer. Foothill prairies. -- swAlta-(seBC), nwUS.

We have checked specimens only from Cardston (DAO).

4. C. lutescens (Greenman) Rydb. -- Calyx lobes acute, more or less lanceolate, 1-5 mm long. Densely puberulent throughout rather than villous. Otherwise much like the last and perhaps only a minor segregate. Early summer. Foothill prairies. -- swAlta-seBC, nwUS.

We have checked specimens (DAO) from Cardston and the Handhills.

5. C. Raupii Pennell -- Flower shortest, less than 2 cm long, shorter than its bract. Tufted and usually less than 2 dm high. Leaves long linear, less than 5 mm wide. Inflorescence darkening to deep violet in drying, rose to mauve or purple when fresh. Early summer. Wet open places, especially if sandy. -- K-Y-(Aka), nQ-nMan-nS-nAlta-nBC.

6. C. pallida (L.) Sprengel var. septentrionalis (Lindley) Gray -- Much as the last but tending to be larger and the inflorescence paler, white or tinged with yellow or pink. Mostly 2-4 dm high. Herbage glabrous or essentially so. Flowers ± 2 cm long. Mid summer. Open, marshy places. -- (F-Mack), L-(NF), NB-nMan, neUS.

Further to the northwest 3 other varieties occur. These are more pubescent, being hirsute to villous, at least in the inflorescence.

7. C. occidentalis Torrey (C. acuminata AA.; C. pallida AA.; C. septentrionalis AA.; C. sulphurea Rydb.) -- Like the next, but the inflorescence yellowish. Flowers and bracts

2-3-(4) cm long, the bracts sometimes purplish below, yellow at tip. First half of summer. Montane prairies. -- (swY-seAka), swAlta-seBC, wUS.

8. C. miniata Douglas (C. lauta Nelson; C. mimeata sphalm; C. rhexifolia Rydb.) -- A showy virgate herb with a scarlet inflorescence with large petaloid bracts. Taller and commonly 4-6 dm high, less densely pubescent. Leaves broader, lanceolate to linear, usually 1 cm wide or somewhat less. Flowers and bracts (2)-3-4 cm long, the latter commonly trilobed. First half of summer. Edge of bluffs and open woods, very common in the mountains at all altitudes. -- seAka, wO-BC, wUS.

Somewhat variable, hence many phenotypes have been segregated under binomials of their own. Thus smaller plants from higher altitudes have been mostly termed C. rhexifolia. The various variants appear to be part of the normal variation of a single species. The extension of range into western Ontario is based on a railway introduction at Dorion.

9. C. hispida Benth var. hispida -- Inflorescence scarlet like the last, but the upper stem leaves narrowly lobed. Also usually smaller, the flowers and bracts tending to be shorter, the latter coloured only a tip. Calyx lobes rounded at summit. Late spring and early summer. Montane prairies. -- swAlta-sBC, nwUS.

To the southwest of us it grades to a coarser var. acuta (Pennell) Ownbey, more abundantly and more stiffly pubescent, the calyx lobes acute.

16. ORTHOCARPUS Nutt.

Annual and with shorter flowers than most Castilleja species. Otherwise quite similar to the latter genus of which it is a minor segregate.

1. O. luteus Nutt. -- A stiffly erect, and usually simple, yellow-flowered annual. Glandular-puberulent throughout. Leaves numerous, narrow, entire. Inflorescence leaves green, typically trifid. Summer. Dry places, mainly on disturbed or wind-eroded soils. -- wO-BC, US.

17. MELAMPYRUM L.

Like Pedicularis, but the flowers axillary rather than racemose. Leaves entire or nearly so, pinnately veined.

1. M. lineare Desr. -- Cowheat -- Leaves dimegueth, the main stem leaves entire, linear and usually less than 5 mm wide; upper leaves larger, lanceolate, most often around 1 cm wide and typically with a pair of sharp teeth at the widest point. Annual, branching opposite, tending to blacken in drying. Flower axillary, white and yellow, usually drying black. Mid summer. Frequent on sandy soils and granitic outcrops. -- NF-SPM, NS-(PEI)-NB-BC, US.

Larger-leaved specimens occur fairly frequently throughout the Canadian range. Varieties based on this and other characters

have been distinguished, perhaps justifiably, south of our borders.

18. EUPHRASIA L.

EYEBRIGHT

Leaves palmately veined and toothed. Otherwise similar to Melampyrum and Pedicularis, the flowers galeate, the upper lip bilobed.

1. E. arctica Lange var. arctica (E. disjuncta Fern. & Wieg.; E. hudsoniana Fern. & Wieg.) -- Small annual with obovate leaves, palmately veined and palmately toothed. Usually simple and less than 2 dm high, the leaves all or mostly opposite. Flowers small, 4-6 mm long, axillary in the upper leaves, white and yellow with lavender lines. Mid summer. Usually on slightly disturbed soil in subarctic situations. -- (G-K, L-NF, NB)-Q-(O)-nMan, US, (Eur) -- Var. dolosa Boivin (E. subarctica Raup) -- Flowers not lined and usually somewhat smaller, 3-4 mm long. Alpine and subarctic. -- Mack-Aka, (nwS)- Alta(n, sw)-BC, (nwUS).

Anderson 1950 extends the range of E. subarctica to Lab. and N.F., but this may be only a reflection of the known range of E. disjuncta which Anderson treats as a partial synonym.

Our only species is doubtfully separable further into a series of minor segregates.

19. ODONTITES Ludwig

Differs from the last by its pinnately veined leaves and the entire upper lobe of the corolla.

1. O. SEROTINA (Lam.) Dum. (O. rubra Gilibert) -- Resembles Euphrasia but larger and much branched. Flowers in second racemes, subopposite below, alternate above. Corolla about 1 cm long, pink, the upper lip subentire, the lower lip shorter and tripartite. Late summer and fall. Rare weed of crops and roadsides: Gimli, Edson. -- (NF, NS-NB)-Q-Man, Alta, US, (Eur).

20. BARTSIA L.

Like a large Euphrasia, but perennial and the upper lip of the corolla neither revolute nor bilobed.

1. B. alpina L. -- Velvet-Bells -- Floral bracts, calyx and corolla purple, drying almost black, thus reminiscent of a Castilleja, but the leaves opposite. Loosely tufted perennial. Leaves ovate, crenate. Flower up to 2 cm long. First half of summer. Arctic meadows, mainly near water-courses. -- G-K, L-(NF), nQ-nMan, Eur.

Macoun 1884 extends the range by more than 1,000 miles to the mouth of the Mackenzie. The justifying specimen (MTMG)

appears to be correctly identified, but it is a collection from J. Anderson and the accuracy of the localities of the latter is open to question (see under Liatris ligulistylis). Since this Mackenzie record has never been confirmed by a later collection, it is now considered erroneous.

21. RHINANTHUS

YELLOW RATTLE

Calyx much enlarged, especially in fruit, completely enclosing the capsule, with only a small opening at top, the seeds being first released inside the inflated calyx, hence the rattle effect. Flower galeate, similar to the last few genera.

1. R. Crista-Galli L. (R. borealis (Sterneck) Chabert; R. Kyrollae Chabert) -- Rattle-Box, Rattle-Seed (Claquette, Graines de Boston) -- Flowers yellow and opposite in a somewhat secund raceme, but not very conspicuous, the plant more noticeable in fruit with its rattling raceme of opposite and inflated calices. Annual. Leaves lanceolate, crenate, the lateral nerves obviously ending in the sinuses. Mid summer. Prairies northward and in the mountains. -- G, K-Aka, L-NF-(SPM), NS-BC, nUS, (Eur).

A much subdivided species. We are not yet convinced that any of the proposed segregates is taxonomically significant.

22. PEDICULARIS L.

LOUSEWORT

Capsule strongly asymmetrical, more or less falcate, opening only or mainly on one side. Calyx regular and 5-lobed to bilabiate. Flowers strongly bilabiate, large and very showy, in terminal racemes which are mostly very dense. The upper lip of the corolla is termed "galea" in this and a few related genera.

- a. Galea prolonged into a thin tubular beak at least 2 mm long.
 - b. Leaves merely serrulate 15. P. racemosa
 - bb. Much more deeply divided.
 - c. Flowers purple to red or pink ... 6. P. groenlandica
 - cc. White or yellow.
 - d. Corolla arched into a half circle 14. P. contorta
 - dd. Nearly straight 7. P. lapponica
 - aa. Not prolonged, merely ending in a broad hood.
 - e. Inflorescence diffuse, the flowers mostly axillary 1. P. parviflora
 - ee. Flowers in one or more well defined and rather crowded racemes.
 - f. Stem leaves subopposite; plant tall and coarse 4. P. lanceolata
 - ff. Alternate.
 - g. Flowers few, 3.0-3.5 cm long 12. P. capitata
 - gg. More numerous and less than 2.5 cm long.
 - h. Inflorescence glabrous; flower yellow with a red tip 2. P. flammea
 - hh. Variouslly pubescent Group A

Group A

Inflorescence puberulent or glandular to long lanate. Racemes crowded. Flowers less than 2.5 cm long. Galea not prolonged.

- a. Rachis densely retrorse-puberulent, otherwise glabrous in the inflorescence 7. P. lapponica
- aa. More pubescent in the inflorescence.
 - b. Inflorescence bracts ciliate or puberulent.
 - c. Bracts long ciliate 13. P. bracteosa
 - cc. Eciliate 11. P. labradorica
 - bb. Lightly to densely long villous-lanate in the inflorescence.
 - d. Flower yellow, the galea ⁺ reddish.
 - e. Calyx bilabiate, the lips more or less crenate, but the lobes not obvious 5. P. canadensis
 - ee. Not bilabiate, but with 5 sub-equal triangular-lanceolate lobes 3. P. Oederi
 - dd. Flower light to deep pink.
 - f. Leaves only 1-(3) on an elongated stem 9. P. sudetica
 - ff. Numerous on a short stem.
 - g. Inflorescence densely long-lanate; the calyces obscured 10. P. lanata
 - gg. Not so densely lanate; at least the dark nerves of the calyx clearly discernable 8. P. Langsdorffii

1. P. parviflora Sm. -- Flower crowded at the tip, but the inflorescence soon elongating and the fruits becoming obviously axillary. Glabrous and purplish annual, usually branched. Leaves pinnatifid, their ultimate lobes and those of the calyx tending to curl. Calyx laterally bilabiate, the lips irregularly crenate. Flower $\frac{1}{2}$ 1.2 cm long, purplish, the galea devoid of beak or subapical teeth. First half of summer. Bogs, rare. -- sK, Aka, cQ-O-(Man)-S-BC, (Eur).

The asiatic plants were recently segregated as P. hyperborea Vved. We have not yet had the opportunity of evaluating this segregate.

2. P. flammea L. -- Red Rattle -- Flower yellow with a deep red tip. Glabrous and less than 2 dm high. Calyx nearly regular and blotched in deep purple. Flower about 1.5 cm long, the galea without beak or subapical teeth. Early summer. Scattered on wet tundra. -- (G)-F-Mack, L-NF, Q-nMan, nwEur.

3. P. Oederi Vahl. var. albertae (Hultén) Boivin (P. flammea AA.) -- Resembles the above, but densely lanate in the inflorescence and somewhat glutinous. Flower bicolour, yellow with a purple red galea. Mid summer. High alpine. -- swAlta

The typical phase occurs to the northwest and differs by its flower monochrome in yellow and its inflorescence glabrous except the ciliate bracts and calices.

4. P. lanceolata Mx. -- A tall and conspicuous prairie species (2)-4-8 dm high, with the stem leaves all or mostly opposite to subopposite. Somewhat long pilose above. Calyx bilaterally bilobed; the lobes ovate and constricted at base. Flower 1.5-2.5 cm long, yellow, the galea prolonged into a short, triangular beak. Second half of summer. Boggy prairies. -- O-sMan, US.

5. P. canadensis L. -- Wood-Betony, Chicken's Heads -- Calyx obliquely truncate and entire or merely undulate-crenate at margin. Resembles the last, but shorter, 2-4 dm high, and the leaves alternate. Flowers 2.0-2.5 cm long, yellow, the galea with a pair of linear subapical teeth. Late spring and early summer. Around Aspen groves. -- sQ-sMan, US, (CA).

6. P. groenlandica Retz. var. groenlandica -- Little Elephant, Elephant's Head -- Beak of the galea very long, upturned, giving the flower an obvious similarity to a small elephant's head, complete with trunk, lower lip and big ears. Glabrous and the whole plant tending to be purplish throughout. Calyx nearly actinomorphic, with 5 deltoid lobes. Flower small, less than 1 cm long, beak excluded. Beak of the galea (the elephant's trunk) 6-10 mm long, strongly incurved. First half of summer. Swampy places northward. -- G, seK, swY, L, nQ-BC.

The B.C. material from the Cascades and all the specimens we have examined from the U.S. proved to belong to var. surrecta (Bentham) Gray, somewhat larger-flowered, the beak 10-15 mm long and mostly sigmoid or spirally coiled.

7. P. lapponica L. -- Densely retrorse puberulent on the stem and especially so on the rachis of the inflorescence. Otherwise glabrous, less than 2 dm high and most often purplish throughout. Calyx obliquely truncate to laterally bilabiate, the margin entire to crenate or weakly dentate. Flowers few, yellow, about 1.5 cm long, the galea prolonged into a short beak. Early summer. Scattered on the tundra, usually in the better drained situations. -- G-Mack-(Y-Aka), nL, nQ-(O)-nMan, Eur.

8. P. Langsdorfii Fischer (P. arctica Br.) -- Very showy herb with a dense raceme of long, deep pink, arched flowers. Closely similar to P. lanata but not so densely lanate. Calyx lobes triangular-lanceolate. Galea with 2 small subapical teeth; the lower lip only about half as long as the galea. Mid summer. Alpine slopes. -- (G)-F, Mack-Aka, swAlta-BC.

9. P. sudetica W. -- Leaves mostly basal, typically with only one stem leaf. Usually purplish and 1-2-(4) dm high, heavily lanate in the inflorescence, but otherwise glabrous. Calyx lobes 5, lanceolate, unequal in length, the sinuses still more unequal. Corolla 1.5-2.0 cm long, 2-toned, the galea purple-pink to maroon, the lower lip paler, pink to nearly white with purple dots. Galea with a pair of lanceolate subapical teeth.

Early summer. Wet calcareous tundra. -- F-Aka, (nwQ)-nO-nMan, BC, Eur.

10. P. lanata C. & S. -- Very showy herb, heavily long lanate throughout, except the basal leaves and pink corollas. Taproot thick and yellow. Mostly 1-2 dm high, the dense and thick inflorescence comprising about half of the plant. Calyx lobes deltoid. Flower 2.0-2.5 cm long. Galea without subapical teeth; the lower lip about as long as the galea. Late spring to mid summer. Mountains, mainly in late snow patches. -- G-Aka, nQ, swAlta-BC, (Eur).

11. P. labradorica Wirsing -- Very branchy, with yellow flowers fading purplish. Partly puberulent, partly retrorse-pilose. Calyx obliquely cut, its margin more or less undulate. Flower \pm 1.5 cm long. Galea with a pair of linear subapical teeth. First half of summer. Northern bogs and tundra. -- G-(F)-K-Aka, L, nQ-(O)-nMan-BC, (Eur).

12. P. capitata Adams -- Flowers very large, 1/5 to 1/3 the length of the plant. Stems solitary, 1-2 dm high, usually leafless, glabrous to pubescent. Flowers few, 3-5 in a short terminal raceme, yellowish-white, often tinged pink. Calyx large, the 5 lobes 4-8 mm long. Galea emarginate at tip, without subapical teeth. First half of summer. Tundra. -- G-Aka, (nQ), swAlta-BC, (Eur).

13. P. bracteosa Benth var. bracteosa -- Main leaves more or less aggregated towards the middle of the stem. Stem 4-9 dm high, leafless below. Main leaves pinnatipartite to pinnate, the upper ones much smaller, merely dentate. Bracts ciliate, abruptly long acuminate. Calyx tube shorter than the 5 lobes, the latter glandular, linear, very uneven, but less than 10 mm long. Flowers 1.5-2.0 cm long, yellow to purple. Galea without subapical teeth. Mid summer. Mountain woods: Cypress, Rockies. -- Alta-BC, nwUS.

In the more western var. latifolia (Pennell) Cronq. the calyx is less pubescent and its tube is longer than the lobes.

14. P. contorta Benth var. contorta -- Flowers recurved in a half circle. Glabrous except the inner face of the calyx lobes. Stem 2-4 dm high. Raceme lax. Calyx with 5 narrow lobes. Corolla white, drying yellow, lower lip large and \pm enwrapping the galea, the latter prolonged into a tubular beak. Mid to late summer. Dry, lower alpine slopes. -- swAlta-seBC, wUS.

In the southern Rockies one may encounter a var. ctenophora (Rydb.) Nels. & Macbr., somewhat villous on the calyx and the corolla pinkish or purplish.

15. P. racemosa Douglas var. alba (Pennell) Cronq. -- Stem leaves less divided, merely serrate. Glabrous, 2-6 dm high. Raceme poorly defined, the lower flowers axillary. Calyx laterally bilabiate, with only 2 lobes well defined. Corolla 1.0-1.5 cm long, whitish; lower lip rather large, galea strongly arched and prolonged into a recurved beak. Second half of summer. Semi-open and springy places in subalpine forests, rare: Jasper. -- swAlta-BC, wUS.

At the longitude of the Cascades it is gradually replaced by the typical pink or purplish-flowered var. racemosa.

On a dot map of Pedicularis hirsuta L. published by Hultén 1958 there is a dot at Churchill, but in 1968 no corresponding specimen could be located at S and we know of none from our area in any other herbarium.

96. OROBANCHACEAE (BROOM-RAPE FAMILY)

Differs from the Scrophulariaceae by its unilocular ovary. Flowers not spurred. Parietal placentation. Parasitic plants devoid of green pigment.

- a. Glabrous herb 1. Conopholis
 aa. Densely glandular-puberulent 2. Orobanche

1. CONOPHOLIS Wallr.

SQUAWROOT

Calyx with (1)-2 partly fused bractlets at base, besides the regular bract. Calyx sinuses asymmetrical, the lower deeper than the others. Otherwise rather like the more common Orobanche.

1. C. americana (L.) Wallr. -- Squawroot, Cancerroot -- A simple brownish herb, densely covered with scale-like leaves. Thick, 1-2 dm high, arising from a large woody knot on the root of the host. Inflorescence dense and spike-like. Bracts similar to the leaves. First half of summer. Very rare parasite on woody plants: Rathwell. -- NS-Q-SMan, US.

Our only known collection is in the private herbarium of A. Champagne of Saint-Boniface, a native manitoban and one of the outstanding amateur botanists in our area. The label data read: A. Champagne, Rathwell, sables, 3m. est du vill., parasite sur Juniper et Armoise, 10-10-44 (Champagne).

A range extension to Alaska by Boivin 1967 was based on a collection from Clockwan (GH). With the collaboration of Mr. R.R. Haynes of Lafayette, Louisiana this specimen has now been revised Boschniakia rossica (C. & S.) Fedtsch. Hence the more restricted range given above.

2. OROBANCHE L.

BROOM-RAPE

No bractlets on the calyx, but some may be present on the peduncle. Upper and lower sinuses of the calyx about equally deep.

- a. Only 1 flower 3. O. uniflora
 aa. Flowers numerous.
 b. Plant dark violet; flowers
 subsessile 1. O. ludoviciana
 bb. Plant orange-brown; peduncles
 longer 2. O. fasciculata

1. O. ludoviciana Nutt. (Myzorhiza ludoviciana (Nutt.) Rydb.) -- Deep violet fleshy plant more than half buried next

to its host. Less than 2 dm high. Peduncles bracteolate, very short or the lower sometimes nearly as long as the tube. Mid summer. Dry hills and sand dunes, rather rare parasite, usually on Artemisia frigida. -- swMan-BC, US, (CA) -- F. albinea Boivin -- Flowers white or nearly so. Local: Val-Marie. -- swS.

F. albinea f.n., floribus fere albis. Type: Boivin & Alex 9870, Val-Marie, platières de la coulée du Français, albino, sur Artemisia frigida, 22 juillet 1952 (DAO).

2. O. fasciculata Nutt. (Anaplanthus fasciculatus (Nutt.) Walpers) -- An orange-brown, fleshy herb, usually hiding under its host. Less than 2 dm high. Peduncles bractless, all or at least the lower ones 1-3 times as long as the flower. Calyx purple tinged, its lobes triangular-lanceolate, about as long as or sometimes much shorter than the tube. Corolla yellowish with a pink tinge and pink nerves. Early summer. Uncommon parasite, nearly always on Artemisia frigida. -- Y, O-BC, US, (CA).

On rare occasions we have come across some white or nearly white individuals. These darken in drying and in the herbarium this albino loses much of its distinctiveness. On that account we have not found it practical to accord taxonomic recognition to the albino form.

3. O. uniflora L. -- Cancerroot -- Strikingly unusual herb reduced to a brownish peduncle and a single terminal flower. Less than 2 dm high and usually in small tufts. Stem very short, more or less buried, bearing a few reduced leaves. Calyx lobes variable. Corolla 1.5-3.0 cm long, yellowish to purple or blueish. Late spring to mid summer. Rocky slopes and edge of woods; very rare parasite. -- (Y-Aka), NF-SPM, NS-(PEI)-NB-O, swS-swAlta-BC, US.

97. LENTIBULARIACEAE (BLADDERWORT FAMILY)

Like the last, ovary unilocular, but the flower spurred. Placentation basal.

- a. Terrestrial with blueish flowers 1. Pinguicula
- aa. Aquatic with yellow flowers 2. Utricularia

1. PINGUICULA L.

Leaves sticky above in the manner of a fly-paper in which the insects get stuck to be eventually digested, often with the help of the involute margin.

- a. Stem villous below 3. P. villosa
- aa. Finely glandular-puberulent; flower larger.
 - b. Upper lip of the calyx trilobed, lower lip bipartite 1. P. vulgaris
 - bb. Upper lip trifid, lower lip somewhat more deeply bifid; flower larger 2. P. macroceras

1. P. vulgaris L. -- Butterwort, Bog-Violet (Grassette, Langué d'oie) -- With a general resemblance to a Violet, but the petals fused. Stemless herb with a rosette of glistening, entire, elliptic leaves. Scape less than 2 dm high, recurved at tip over the single hanging flower. Corolla (including spur) (1.2)-1.5-(1.8) cm long, abruptly contracted into a linear and somewhat deflexed spur 4-6 mm long. Fruit about twice as long as the calyx. Early summer. Mud flats and mossy bogs northwards and in the mountains. -- G-(F)-K-Aka, L-SPM, NS, NB-BC, US, Eur.

2. P. macroceras Link -- Like the last but the calyx lobes less uneven and the corolla somewhat larger. Corolla 2.0-3.0 cm long, more gradually tapering into a direct spur 5-10 mm long. Fruit about as long or slightly shorter than the calyx. Early summer. Wet mossy places in the mountains. -- Y-Aka, swAlta-BC, (nwUS, eEur).

In the field this species may seem to be only a larger form of P. vulgaris and on this account is often lumped with the latter, but on closer examination there is ample morphological basis for the distinction and the discontinuity is obvious either in flower or in fruit.

3. P. villosa L. -- Only half as large as the above two. Stem villous below, glandular-puberulent above. Flower 7-8 mm long. First half of summer. In moss and Sphagnum hummocks of tundra and subarctic bogs. -- K-Aka, L, nQ, nMan-S-(Alta-BC), Eur.

2. UTRICULARIA L.

BLADDERWORT

Aquatic and mud plants with emerged yellow flowers and submerged and finely dissected leaves which bear small, bladder-like, plankton traps.

- a. Leaves and bladders minute and not readily observed 4. U. cornuta
- aa. Leaves finely dissected, submerged.
 - b. Leaves and bladders borne on separate branches 3. U. intermedia
 - bb. Bladders mixed with the leaves or borne on them.
 - c. Leaves and flowers less than 1 cm long 2. U. minor
 - cc. Much larger 1. U. vulgaris

1. U. vulgaris L. var. americana Gray (U. macrorhiza Le-Conte) -- (Millefeuille des marais) -- Much in evidence when it covers the water of sloughs with a multitude of yellow, spurred flowers. Flowering shoot erect, bearing a raceme of flowers above the water. Leafy shoots free floating just below the surface of the water. Leaves divided into filiform segments, bearing numerous bladders, the latter commonly 3 mm long. Mid summer. Stagnant but non-alkaline waters. -- K-Aka, L-SPM, NS,

NB-BC, US, (CA).

For a discussion of the value of this cisatlantic variant, see Rhodora 43: 642-5. 1941 and also Boivin 1960 for the opposite view. In the transatlantic typical var. vulgaris the corolla spur is conic, straight or slightly incurved, gradually tapered and rounded at tip. With some allowance for an occasional intermediate, our cisatlantic plants may be recognized by their spur being infundibuliform, asymmetrical and abruptly contracted into a falcate to strongly recurved and acute tip.

2. U. minor L. -- Like a diminutive form of the first. Sterile shoots creeping on the surface of the mud in shallow waters. Leaf segments flat, the main ones about 0.5 mm wide, the ultimate ones tapered, 0.2-0.3 mm wide at the base. Mid summer. Boggy waters northward. -- (G), K-Aka, L-(NF)-SPM, NS-BC, US, Eur.

2.X U. ochroleuca R. Hartman -- Hybrid of the following and rather neatly intermediate. Leaf segments irregularly divided, the ultimate ones rather elongate but little narrower, irregularly denticulate. Branches dimorphic, as the next, but with a few bladders scattered among the leaves and a few reduced leaves scattered among the bladders. Local: Churchill. -- G, K-Mack, Aka, NE, Q-Man, CB, Eur.

3. U. intermedia Hayne -- Ultimate segments minutely denticulate, linear-oblong, 0.2-0.5 mm wide. Like the last but the leaves and bladders segregated on separate branches. Flower 1.0-1.5 cm long. Mid summer. Shallow waters of boggy pools. -- G, K-Aka, L-SPM, NS, NB-BC, US, Eur.

4. U. cornuta Mx. -- Gillflower -- Seemingly reduced to (1)-2-(3) flowers on a scape and a shallow taproot. If carefully dug up, the taproot proves to be branched and bears filiform leaves and minute bladders. Flowers 1.5-2.0 cm long. Mid summer. Peaty shores, rare: Petits Poissons River. -- L-SPM, NS, sMan-mwS, US, (CA).

An earlier report by Lowe 1943 was discounted by Scoggan 1957 as unsubstantiated. Our Manitoba report is based on the following more recent collection: A. Champagne, Sainte-Geneviève, savanne aux Sarracénies, aux sources de la rivière des Petits Poissons, 6 août 1958 (DAO). And the Saskatchewan record on G. W. Argus 461 - 62, vicinity of "Little Gull" Lake, lat. 59°01'N, long. 109°0'W, bog islands, 11 July, 1962 (DAO, SASK).

98. MARTYNIACEAE (UNICORN-PLANT FAMILY)

Flower zygomorphic and the capsule unilocular like the last two families, but neither carnivorous nor parasitic, the herbage green, the flower not spurred and the placenta parietal.

1. PROBOSCIDEA Schmid

UNICORN-PLANT

Corolla tube short-ellipsoid. Fertile stamens 4.

1. *P. LOUISIANICA* (Miller) Thell. -- Unicorn-Plant, Ram's Horn (Cornaret, Corne du diable) -- Fruit very long and deeply bifid. A tall and coarse herb abundantly glandular-pubescent and glutinous. Leaves opposite, cordate and rather large, somewhat like small rhubarb leaves. Flowers up to 5 cm long, yellowish-white, in a terminal raceme. Fruit about 1 dm long, tapered at both ends. First half of summer. Rare garden weed, appearing as an impurity in seed: Nipawin. -- O, S, US, (CA).

Order 53. GERANIALES

A basic type, much as in the Caryophyllales, the floral parts in 5's and free except for the carpels. But the seeds only 1 or 2 per carpel and the leaves alternate or/and variously cut.

- a. Flowers strongly zygomorphic 102. Balsaminaceae
- aa. Quite regular.
 - b. Leaves entire 99. Linaceae
 - bb. Leaves toothed to compound.
 - c. Leaves simple or pinnate 100. Geraniaceae
 - cc. Trifoliate 101. Oxalidaceae

99. LINACEAE

(FLAX FAMILY)

Each carpel maturing two seeds, splitting in 2 halves at maturity.

1. LINUM L.

FLAX

The basic and unspecialized type of the family.

- a. Flowers blue or white.
 - b. Flowers erect and more or less axillary 1. L. usitatissimum
 - bb. Peduncles spreading or recurved; flowers in more or less secund racemes 2. L. perenne
- aa. Yellow.
 - c. Styles fused except at tip; capsule somewhat retuse at tip 3. L. rigidum
 - cc. Styles free except at base; capsule abruptly short acuminate 4. L. sulcatum

1. *L. USITATISSIMUM* L. -- Flax, Linseed (Lin) -- A blue-flowered field crop. Stiffly erect glabrous annual. Leaves narrow, entire, alternate, with 3 parallel nerves. Flowers nodding in bud, soon erect, axillary at alternate nodes of the branches. Petals 1.0-1.5 cm long. Early summer. Casual on roadsides, etc. -- Mack, Aka, NF, NS-BC, US, Eur -- *F. LEUCANTHUM* Maly -- Flowers white. Infrequent. -- S, (Eur).

2. *L. perenne* L. var. Lewisii (Pursh) Eaton & Wright (*L. Lewisii* Pursh) -- Much like the first. Tufted perennial, (2)-4-(6) dm high with ascending stems. Flowers blue, spreading to

reflexed on the lower side of the branches. Fruit 5-7 mm wide, slightly longer than broad. Late spring and early summer. Steppes and hillsides. -- (swF), Mack-Aka, Q-BC, US, (CA) -- F. albiflorum Cock. -- Flowers white. Local. -- Alta -- Var. Lepagei Boivin (L. Lepagei Boivin; L. Lewisii Pursh f. Lepagei (Boivin) Lep.) -- Generally smaller and white-flowered. Stems 1-3 dm high. Fruit about 4 mm long, less than 5 mm wide. Inflorescence often not clearly secund. Mid summer. Sandy seacoasts. -- seK, nO-nMan.

Var. Lewisii is commonly ranked as a distinct species from L. perenne, but as pointed out by Hitchcock 1961, the morphological justification is not very impressive. In the eurasian var. perenne the flowers are dimorphic; some have styles only 1.5-2.5 mm long and overtopped by the stamens, others have styles 4-7 mm long and overtopping the stamens, and the flowers are erect or nearly so. In another eurasian variant which also occurs as a rare adventive in Ontario, var. austriacum (L.) Schiede, the inflorescence is more like that of our var. Lewisii. The latter differs from the two eurasian types by its flowers all alike, the styles 4-8 mm long and much overtopping the stamens.

Plants from the Hudson Bay coasts are generally smaller and have consistently smaller and more depressed fruits. They are also all white-flowered except one collection (f. Baldwinii) from Long Island which is just as blue-flowered as the wide-spread prairie variant (var. Lewisii). Apart from its flower colour, this Long Island collection is quite typical of var. Lepagei, being smallish, only 2 dm high or less, and small-fruited, and may be known as: L. perenne var. Lepagei f. Baldwinii f.n., floribus coeruleis. Type: W.K.W. Baldwin 1768, Long Island, east shore, July 25-28, 1949 (Sherbrooke). Isotype at CAN. The report of var. Lewisii from Keewatin by Boivin 1967 was based on f. Baldwinii.

While we are here treating var. Lepagei as a variety, we consider it to be a marginal case within our concepts of species and variety; it could have been retained quite justifiably as a weak species. Var. Lepagei is distinguished by one constant character (fruit size and shape), one pretty nearly constant character (flower colour) and one overlapping character (overall plant size). It is also ecologically specialized to seashores.

3. L. rigidum Pursh var. rigidum (L. compactum Nelson; Cartholinum compactum (Nelson) Small; C. rigidum (Pursh) Small) -- Yellow Flax -- Annual with yellow flowers opposite the leaves or terminal. Very branchy. Sepals 4 mm long or more, all or mostly gone by fruiting time, glandular-serrulate with yellow glands. Petals very fugaceous. Capsule 4-5 mm long, slightly retuse at summit, splitting into 5 segments acute at tip. First half of summer. Wind eroded or freshly disturbed soils. -- sMan-Alta, US.

The stem in our plants is glabrous above, scabrous or lightly puberulent towards the base. In the more southern and

more puberulent var. Carteri (Small) C.M. Rogers the stem is scabrous or puberulent on the angles from base to top.

4. L. sulcatum Riddell var. sulcatum (Cartholinum sulcatum (Riddell) Small) -- Like the last. Branching near the top only. Sepals 2.5 mm long or more, still present in fruit. Capsule \pm 3 mm long, its 10 segments abruptly short acuminate at tip. Second half of summer. Sandy soils. -- Q-sMan, US.

Despite various reports to the contrary, all yellow-flowered Saskatchewan specimens examined proved to belong to L. rigidum.

Our plants are perhaps to be contrasted with a Floridan var. Harperi (Small) C.M. Rogers in which the flowers are reportedly gathered in somewhat racemiform inflorescences.

100. GERANIACEAE (GERANIUM FAMILY)

Type of fruit rather unique, at dehiscence suggesting a multi-pronged fishhook. The tip of the ovary is prolonged into a very long beak and at maturity each carpel separates longitudinally from the column for most of its length, but remains attached at the top. When dry, each carpel coils upward and its single seed may then be liberated.

- a. Leaves simple 1. Geranium
 aa. Leaves compound 2. Erodium

1. GERANIUM L.

CRANESBILL

Leaves simple, palmately lobed. Style column not twisted.

- a. Perennials with flowers over 2 cm wide.
 b. Flowers white 3. G. Richardsonii
 bb. Pink or mauve.
 c. Leaves evenly pubescent below... 2. G. viscosissimum
 cc. Pubescent only along the nerves 1. G. pratense
 aa. Annuals or biennials; flowers much smaller.
 d. Sepals small and merely acute at tip ... 6. G. pusillum
 dd. Abruptly contracted at tip into an acicular point 2-4 mm long.
 e. Pedicels longer than the calyx, some of them at least twice longer 4. G. Bicknellii
 ee. Shorter, some or all of the pedicels shorter than the calyx 5. G. carolinianum

1. G. pratense L. var. erianthum (DC.) Boivin (G. erianthum DC.) -- Like the next. Stem densely recurved-puberulent. Peduncles with dense, short, recurved hairs mixed with much longer spreading and glandular ones, the glands blackish. Mid summer. Montane prairies. -- Y-Aka, swAlta-nBC, eEur.

In ours the pedicels are 0.5-1.5 cm long and the filaments are long pilose in their lower half. The typical eurasian phase

is sporadically naturalized east of us and it may be distinguished by its pedicels being more variable, 0.5-2.5 cm long, their villosity not so long, and its filaments less pubescent, being merely ciliate along the dilated base.

Geranium pratense L. was collected by J.F. Higham in 1920 at Winnipeg. The label carries the acronym M.A.C., an abbreviation for Manitoba Agricultural College and there is nothing to suggest that this plant was not a cultivated ornamental. It is the basis for the Manitoba report by Scoggan 1957. This cultivated ornamental has sometimes been found as an escape in the east and it might also turn up in southern Manitoba.

2. G. viscosissimum F. & M. (var. nervosum (Rydb.) C.L. Hitchc.; G. nervosum Rydb.) -- Showy herb, less than 1 m high, with a corymbose inflorescence and large cherry-pink flowers. Stem hirsute and glandular-puberulent. Inflorescence densely glandular-pubescent, the hairs very uneven in length and the glands yellowish. Mid summer. Lower montane and foothill prairies. -- S-sBC, US -- F. album (Suksd.) St John -- Flowers white. Not to be confused with the next species with a very different type of pubescence. Local: Calgary. -- Alta-BC, (US).

Frequent in western Alberta, also occurring in the Touchwood and Cypress Hills.

3. G. Richardsonii Fischer & Trautv. -- Flowers large and white. Stem glabrous below, lightly reflexed-strigose above. Inflorescence densely glandular-villous, the hairs with a purplish head. Mid summer. In and around deciduous woods, mainly in the foothills and lower altitudes. -- wMack-Y, swS-BC, US.

4. G. Bicknellii Britton -- A very branchy annual with sepals (like most of our species) abruptly contracted into a subulate tip 2 mm long or more. Stem hirsute, becoming glandular pubescent in the inflorescence, the hairs with clear or yellowish heads. Petals pink, 5-6 mm long. Summer. Frequent, mainly on disturbed soils. -- Mack-Aka, NF, NS, NB-BC, US.

5. G. carolinianum L. var. sphaerospermum (Fern.) Breitung (var. confertiflorum AA.; G. sphaerospermum Fern.) -- Sepals rather broad, broadly ovate to suborbicular and becoming (4)-5-7-(8) mm wide in fruit. Stem and branches recurved-pubescent to reflexed-strigose, the pedicels often glandular-pubescent. Pedicels less than 1 cm long. Summer. Shores, granite outcrops, open woods and disturbed soils, sometimes weedy. -- O-BC, US.

The sepals are \pm dimegueth and in our variety, the common and wide ranging one in Canada, the outer sepals are larger, ovate to suborbicular, enlarging in fruit up to (4)-5-7-(8) mm wide. The more southern typical phase barely enters Canada both east (Point Pelée) and west of us; its sepals are not so obviously dimegueth and they are narrower, being elliptic, and enlarging only up to 4-5-(6) mm in fruit; also the seeds are not quite so plump.

As will be noticed, there is a fair amount of overlap in

sepal width and in both varieties they enlarge in fruit; taxonomic distinctions based primarily on these characters would be difficult to implement. Our taxonomic distinction rests primarily on the broader shape of the sepals of our common variety.

6. *G. PUSILLUM* L. -- Fruit shortest, less the 1.5 cm long. Stem densely recurved puberulent, passing to densely glandular-puberulent in the inflorescence. Sepals 2-4 mm long. Stamens only 5. Summer. Rare and evanescent weed of disturbed soils: Brandon. -- Q-sMan, BC, US, Eur.

Most earlier reports of *G. Robertianum* L. from Manitoba were discounted by Scoggan 1957, but another report by Anderson 1949 is still to be investigated; yet it may have been based on nothing more than some earlier report discounted by Scoggan.

2. *ERODIUM* L'Hér.

STORK'S BILL

Leaves pinnate. Column and carpels becoming spirally twisted and tangled when dry at maturity. Otherwise like Geranium, including the subulate tip of the sepals.

1. *E. cicutarium* (L.) L'Hér. -- Filaria, Pin-Clover (Aiguillettes, Herbe à la fourchette) -- Pedicels becoming reflexed at base and geniculate under the erect fruit. Villous and more or less glandular-pubescent throughout. Leaflets opposite, lyrate-pinnatifid. Umbels on very long peduncles and very much overtopping the foliage. Filaments petaloid. Mid to late summer. Infrequent but conspicuous weed. -- (Aka), L, (NS), NB-BC, US, CA, SA, Eur, Oc.

101. OXALIDACEAE (WOOD-SORREL FAMILY)

A primitive type of Geraniales, the carpels containing many seeds and loculicid at maturity. Leaves alternate or basal and trifoliate. Leaflets obcordate.

1. OXALIS

WOOD-SORREL

Our only genus.

1. *O. CORNICULATA* L. (*O. Dillenii* Jacq.; *O. europaea* Jordan; *O. stricta* L.; *Xanthoxalis Bushii* Small; *X. stricta* (L.) Small) -- Yellow Sorrel, Sheep's Clover (Pain d'oïseau, Surette) -- Rather suggesting a Clover with its trifoliate leaves and obcordate leaflets, but the flowers regular and in few-flowered umbels. Leaflets entire, somewhat reflexed. Flowers yellow. Capsule erect on a spreading pedicel. Summer. Casual weed of disturbed soils, sometimes in woods. -- (Aka), NF, NS-BC, US, CA, (SA), Eur, Oc.

Reputedly partly native in North America, but in our experience it always seems to occur as an invader in man-made disturbances.

Quite variable and commonly subdivided into a variable number of microspecies. Small recognized 10 in 1907, but this was reduced to five by Wiegand in 1925. In 1950 Fernald also

recognized 5, but this was reduced to 3 by Gleason in 1952; the same number as Eiten in his 1955 and 1963 monographs. The characters emphasized vary from author to author, but they are mainly the pubescence, the root system, the habit, the type of inflorescence and the angle of the pedicels. Within the primary area of our studies we were unable to sift out any meaningful segregate by the means of said characters or of their various recombinations. We are therefore still unconvinced that any of the proposed segregates could be taxonomically significant.

102. BALSAMINACEAE (BALSAM FAMILY)

Flower very irregular, shaped like a "horn of plenty" and apparently made up of 6 separate parts, 3 of which are petaloid sepals, the other 3 are partly fused petals.

1. IMPATIENS L. TOUCH-ME-NOT, JEWEL-WEED

Fruit an explosive capsule which will, when touched at maturity, open abruptly and throw its seeds.

- a. Flower orange 1. I. capensis
 aa. Pale yellow and larger 2. I. Noli-tangere

1. I. capensis Meerb. (f. immaculata (Weath.) Fern. & Schub.; I. biflora Walter) -- Balsam, Touch-me-not (Chou sauvage) -- Peduncle of the inflorescence twisted around the petiole so the raceme hangs below the leaf. Very soft and juicy stem, very shallowly rooted. Flower drooping, 2.0-2.5 cm long, variable in colour, usually pale orange and often spotted in purple-brown. Spurred sepal 1.2-1.6 cm long, abruptly contracted into a spur 7-10 mm long and recurved under the sepal. Mid summer to mid fall. Wet and shaded places, preferably if exundated. -- swMack, Aka, NF-(SPM), NS-BC, US.

2. I. Noli-tangere L. (I. occidentalis Rydb.; I. pallida AA.) -- Touch-me-not (Herbe Sainte-Catherine, Pétard) -- Like the last, but the flower larger, 2.5-4.0 cm long, paler, also dotted. Spurred sepal 1.8-2.5 cm long, gradually tapered into a recurved spur ± 10 mm long. Summer. River shores and low, wet woods. -- Aka, (Man)-S-BC, (US), Eur.

Order 54. POLEMONIALES

Ovary typically 3-locular, the flower otherwise 5-merous with fused sepals and petals and 5 stamens alternating with the petals.

- a. Ovary 3-locular; leaves mostly
 opposite 103. Polemoniaceae
 aa. Unilocular; leaves
 alternate 104. Hydrophyllaceae

103. POLEMONIACEAE (POLEMONIUM FAMILY)

The typical family, the fruit a 3-locular capsule.

- a. Leaves simple and entire.
 - b. Leaves all or mainly opposite, at least those from the middle and lower part of the stem 1. Phlox
 - bb. Alternate 2. Collomia
- aa. Deeply dissected to compound.
 - c. Leaves palmatifid 3. Linanthus
 - cc. Pinnately divided.
 - d. Leaves pectinately dissected into very narrow segments 4. Navarretia
 - dd. Pinnately divided into well defined leaflets 5. Polemonium

1. PHLOX L.

PHLOX

Calyx tube with green ribs and hyaline internerves. Filament inserted at various levels on the corolla. Much resembling the Caryophyllaceae, but both the sepals and petals fused.

- a. Annual; upper stem leaves alternate 2. P. gracilis
- aa. Perennial; all stem leaves opposite
 - b. Tufted, 2-8 dm high 1. P. pilosa
 - bb. Cushion-forming and only 1 dm high or less.
 - c. Calyx densely glandular-pubescent 2. P. alyssifolia
 - cc. More or less arachnoid 3. P. Hoodii

1. P. PILOSA L. var. FULGIDA Wherry -- Sweet Williams -- Showy herb, better known as a garden plant. Pubescent, becoming densely villous above. Inflorescence a small terminal cyme. Flower colour variable. Calyx lobes very long attenuate, much longer than the tube. Corolla with a thin and long tube and large and spreading lobes. Early summer. Locally escaped from cultivation: Winnipeg. -- sMan, US.

It is very doubtful if the range of this species actually extends as far west as Saskatchewan as given by Fernald 1950.

The typical phase is densely glandular-pubescent in the inflorescence; it barely enters Canada, being known only from Amherstburg, near Windsor in southwestern Ontario.

2. P. gracilis (Hooker) Greene var. gracilis (Microsteris gracilis (Hooker) Greene) -- Upper stem leaves alternate, the middle and lower opposite, otherwise quite similar to the much more common and somewhat larger Collomia linearis. Branched in the upper part. Stem leaves glabrous or somewhat ciliate towards the base. Densely (glandular-) pilose in the inflorescence, the stem becoming gradually glabrous towards the base. Calyx green on the lobes and the nerves, hyaline on the fragile internerves. Corolla 8-15 mm long. First half of summer. Dry gravelly soils in open places, mostly hillsides; rare: Rockies. -- Y-(seAka), swAlta-sBC, US.

In the more western var. humilior (Hooker) Boivin, the stem is branched to the base and the flowers are somewhat smaller, the corolla 5-10 mm long.

3. P. alyssifolia Greene -- A very pungent perennial forming loose cushions or tufts. Leaves 1.0-2.5 cm long, long ciliate, marcescent, very stiff due to a marginal thickening, ending in a short but sharp, whitish point. Flower terminal, or axillary from a subterminal node. Late spring or early summer. Exposed rocky ridges, rare. -- sWS-sAlta, US.

4. P. Hoodii Rich. -- Forming small dense cushions covered with white flowers. Herbage ± arachnoid. Leaves less than 1 cm long, somewhat pungent and with a white and thickened margin. No stipules. Flowers single at the end of the numerous branches. Spring. Common and showy on steppes and dry hillsides. -- (Mack)-Y-(Aka), swMan-Alta-(BC), US.

The habitually very similar Paronychia is merely puberulent and has very long, membranous stipules.

A collection from the Handhills is more lax, nearly glabrous, larger-flowered, etc., and is somewhat transitional to P. caespitosa Nutt., not otherwise known from our area.

2. COLLOMIA Nutt.

Calyx of uniform texture. Leaves alternate. Otherwise as in Phlox.

1. C. linearis Nutt. (Gilia linearis (Nutt.) Gray) -- Flower very narrow, about 1 cm long, but the tube 1 mm wide or less and the lobes only 1 mm long. Annual and usually virgate. Herbage densely puberulent, becoming ± glandular in the inflorescence. Calyx two-toned, the lobes green, the tube much paler, nearly white. Summer, mostly just before mid summer. Frequent in open places, especially if disturbed, or wind-eroded, or flooded in spring. -- Mack-Aka, NS-BC, US.

Native with us, but only a weedy adventive further east.

3. LINANTHUS Bentham

Leaves palmatifid. Seed becoming mucilaginous when wet. Otherwise as in Phlox.

1. L. SEPTENTRIONALIS Mason (L. Harknessii AA.) -- Leaves opposite, sessile and palmatifid into linear segments. Small annual with small flowers on long peduncles. Late spring to mid summer. Wind-eroded steppes; introduced at Nashlyn and Medicine Hat. -- sWS-sBC, US.

Native west of us.

4. NAVARRETIA R. & P.

Leaves alternate and finely dissected. Calyx lobes unequal in length.

1. N. minima Nutt. var. minima (N. intertexta (Bentham)

Hooker var. propinqua (Suksd.) Brand) -- Small pungent annual herb. Leaves bipectinatifid into stiff and sharp pointed segments. Larger calyx lobes tripartite in the manner of the leaves. Early summer. Arroyos and playas. -- swS-sBC, US.

The other variety in Canada is var. intertexta (Bentham) Boivin which reaches its northern limit of range at Victoria, a larger plant mostly 1.0-2.5 dm high, more densely villous in the inflorescence and larger-flowered, the corolla 7-11 mm long and exserted beyond the tip of the calyx lobes.

5. POLEMONIUM

JACOB'S LADDER

Similar to Phlox, but the flower slightly irregular, the stamens being deflexed towards the lower side. Leaves pinnately divided into discrete leaflets.

- a. Leaflets seemingly fasciculate
 - or verticillate 3. P. viscosum
- aa. Opposite to subopposite.
 - b. Corolla lobes finely
 - ciliate 1. P. acutiflorum
 - bb. Corolla glabrous; plant
 - smaller 2. P. pulcherrimum

1. P. acutiflorum W. (P. caeruleum L. ssp. occidentale (Greene) J.F. Davidson; P. occidentale Greene) -- Virgate perennial with pinnate leaves and large blue flowers in a thyrsoid or narrowly paniculate inflorescence. 3-12 dm high. Glabrous below, densely glandular-puberulent above. Leaflets lanceolate, mostly 1-2 cm long. Corolla lobes 1.0-1.5 cm long, ciliate or ciliate, \pm pubescent dorsally, 2-3 times longer than the tube. First half of summer. Willow or Birch thickets at low altitudes. -- Mack-Aka, wAlta-BC, Eur.

2. P. pulcherrimum Hooker var. pulcherrimum -- Generally smaller than the last and more branchy. 1-3 dm high, branched at least in the upper half. Leaflets all free, mostly 3-8 mm long and 5 mm wide or less, mostly suborbicular to elliptic. Corolla lobes 4-8 mm long, glabrous, generally shorter than the tube. Mid spring to mid summer. River gravels and rocky exposures in the mountains. -- Mack-(Y-Aka), sAlta-BC, (US).

The more western var calycinum is a generally larger plant, 2-5 dm high; its larger leaflets are 1-3 cm long, 0.5-1.0 cm, and the last 3 are \pm connate at base; calyx lobes generally longer than the tube. We know it only from lake Oosta and Mount Alpine, both a DAO.

3. P. viscosum Nutt. var. viscosum -- Primary leaf-segments digitately divided into 2-4 sessile leaflets, hence the pseudoverticillate condition of the leaflets. Glandular-pubescent throughout. Flowers blue, rather large, in a somewhat congested terminal inflorescence. First half of summer. High alpine on rock slides in Waterton. -- swAlta-BC, US -- F. leucanthum L. Williams -- Flowers white. Waterton. -- swAlta-

swBC, US.

The more southern var. mellitum (Gray) stat. n., P. confertum Gray var. mellitum Gray, Proc. Ac. Nat. Sc. Phil. 15:73. 1853, is a more southern plant known from the Black Hills and from the Rockies, distinguished by its yellow flowers in a more elongated inflorescence.

Gilia aggregata (Pursh) Sprengel and G. congesta Hooker were both reported for Saskatchewan and Alberta by a variety of authors, and as recently as Budd 1957 and 1964. However Breitung 1959 has pointed out his inability to locate justifying specimens and we have had a similar experience. Neither was represented at SCS in 1967 and 1968.

104. HYDROPHYLLACEAE (WATERLEAF FAMILY)

Ovary reduced from the last to 2 carpels and only 1-2-locular. Flowers solitary or in cymes, often scorpioid cymes as in the Boraginaceae.

- a. Flowers all or mostly solitary.
 - b. Leaf lobes entire 2. Nemophila
 - bb. Remotely dentate 3. Ellisia
- aa. In scorpioid cymes.
 - c. Leaves palmately lobed 5. Romanzoffia
 - cc. Entire or dentate to pinnately divided.
 - d. Inflorescences strongly secund and recurved, the main axis distinct 4. Phacelia
 - dd. More or less symmetrical, lacking a main axis and rather dichotomously branched 1. Hydrophyllum

1. HYDROPHYLLUM L.

WATERLEAF

Capsule unilocular. Otherwise resembling Phacelia.

1. H. capitatum Douglas var. capitatum -- Typically an herb with a single pinnatipartite leaf overtopping the globular inflorescence. Sometimes with 1-2 additional leaves and/or inflorescences. Hirsute throughout, including the purplish corolla. Stamens long exserted, purplish-black. Late spring and early summer. Exposed places at middle altitudes. -- swAlta-sBC, US.

In two other varieties from western U.S.A., var. alpinum Watson and var. Thompsonii (Peck) Const., the inflorescence equals or overtops the foliage.

Reports of H. virginianum L. from Manitoba are doubtful at best. There was no corresponding sheet at GH in 1965. The only relevant sheet found was formerly at the Rust Research Laboratory at Winnipeg, (now at DAO), a collection by Wallace, Selkirk, open woods, 1946. According to persons connected with this collection, there is some doubt about the correctness of

the labels of the Wallace collections and some specimens with Manitoba localities may actually have been collected in Minnesota. Selkirk is not a locality where isolated stations are commonly found and it is so far away from the rest of the range that unless and until confirmed by a later collection, this Selkirk report should be held as doubtful.

2. NEMOPHILA Nutt.

BABY-BLUE-EYES

Like the next but the calyx with 10 dimerous lobes, the smaller ones sharply reflexed.

1. N. breviflora Gray -- Solitary flowers borne opposite the leaves on reflexed pedicels. Leaves alternate, pinnatipartite. Calyx very long hispid-ciliate, otherwise glabrous. First half of summer. Mostly disturbed soil in the mountains: Waterton. -- swAlta-sBC, US.

3. ELLISIA L.

Flower solitary or mostly so.

1. E. nyctelea L. -- Aunt Lucy (Bois côtelet, Bois à cô-telettes) -- Flowers partly opposite the leaves like the last, partly in terminal bractless racemes, partly axillary. Leaves opposite below, alternate above, pinnatipartite. Calyx ciliate and hispid dorsally, enlarging in fruit. Capsule hispid. Early summer. Damp shaded places and disturbed soils. -- sMan-sAlta, US.

4. PHACELIA Juss.

SCORPION-WEED

Flowers in scorpioid cymes similar to those in the Boraginaceae, that is the flowers are secund on a well defined and [†] recurved main axis or on its branches. Calyx-lobes only slightly fused at base.

- a. Leaves suborbicular, broadly dentate.. 8. P. campanularia
- aa. More elongate and either more deeply cut or entire.
 - b. Leaves entire or merely with 1-2 pairs of lobes.
 - c. Virgate annual with linear leaves..1. P. linearis
 - cc. Tufted perennial with lanceolate leaves 2. P. hastata
- bb. More elaborately cut.
 - d. Leaves compound, with pinnatipartite segments 6. P. tanacetifolia
 - dd. Simple or the lower ones partly pinnate at base.
 - e. Perennial and not glandular or inconspicuously so on the calyx.
 - f. Leaves pinnatipartite, the segments linear 3. P. sericea
 - ff. Leaves pinnatifid, the lobes triangular to broadly lanceolate 4. P. Lyallii

ee. Annual or biennial; glandular throughout.

g. Corolla whitish and

glabrous 5. P. thermalis

gg. Bluish-mauve, larger and

pubescent externally 7. P. Franklinii

1. P. linearis (Pursh) Holz. -- Annual with most leaves tripartite into widely spreading linear lobes. Leaf sometimes with 5 lobes, the nervation reduced to 1 nerve per lobe. Anthers about level with the top of the blue corolla. Early summer. Dry open slopes at low altitude. -- swAlta-sBC, US.

There is at DAO a series of collections by R.H. White and R.M. White, (such as one P. linearis labeled Calgary) with toponyms that are more likely to represent mailing points rather than places of collection.

2. P. hastata Douglas (var. leucophylla (Torrey) Cronq.; P. heterophylla AA.; P. leptosepala Rydb.) -- Leaves with conspicuous and nearly parallel nerves imbedded in the soft pubescence. Densely villous or hispid throughout. Leaves entire or some of them with a subbasal pair of lobes or leaflets. Flowers crowded and secund in many circinate cymes. Corolla white to pink. Mainly mid summer. Open places in the mountains. -- swAlta-sBC, US.

3. P. sericea Gray var. sericea -- Perennial with leaves dissected into linear segments, (1)-2-3-(4) dm high. Leaves pinnatipartite to nearly bipinnatipartite, grayish pubescent, the segments 1-2-(3) mm wide, \pm linear, obtusish to rounded at tip. Flowers in a dense thyrse of circinate cymes. Filaments long exerted and usually darker than the corolla. Late May to mid spring. Gravel ridges, rocky outcrops and talus slopes at all altitudes. -- swAlta-BC, WUS.

Some Canadian specimens are more or less intermediate to the otherwise more southern var. ciliosa Rydb., taller and larger-leaved, the segments 3-5 mm wide, rather lanceolate and acute at tip. Canadian reports of var. ciliosa and of P. idahoensis for Alberta and westward were apparently based on specimens of var. sericea (DAO, etc.). There is also west of us a var. caespitosa Brand, smaller and its leaves less dissected, the primary lobes entire or nearly so. The latter was reported for Yukon by Porsild 1951, but the relevant specimen was referred to P. mollis Macbr. by Gillett 1960.

4. P. Lyallii (Gray) Rydb. -- Like the last but the leaves less dissected and the segments broader. Pubescence not so dense and longer, the foliage green. Inflorescence short, often corymbose. Mid summer. Alpine talus slopes in Waterton. -- swAlta-seBC, nwUS.

5. P. THERMALIS Greene (P. glandulifera AA.) -- Calyx enlarging at maturity, the veins reticulate, conspicuous and much thickened, especially the marginal one. Annual, hirsute and densely glandular throughout. Rosette of very few leaves.

Stem leaves partly pinnatifid, becoming pinnate towards the base. Flower small, \pm 4 mm long, barely overtopping the calyx. (Summer?). Rare weed from the levee of an irrigation ditch: Val-Marie. -- swS, US.

6. *P. TANACETIFOLIA* Benth -- Leaves very much divided, pinnate, the primary segments pinnatifid, the secondary ones dentate to pinnatifid. Annual, hirsute, the stem lightly retrorse-hirsute. Flowers light pink. All summer. Unusual and evanescent weed around gardens. -- O-BC, wUS, Eur.

Known from Brandon (1897), Regina, Saskatoon, Humboldt, Kevissville and, outside our area, at Toronto and Montney.

7. *P. Franklinii* (Br.) Gray -- Showy blueish-flowered biennial along roads in Jack Pine forests. Virgate from a heavy, marcescent rosette. Herbage finely glandular and long hirsute. Leaves pinnatifid. Early summer. Casual in very dry, forested soils, especially if disturbed. -- Mack-sY, wO-BC, US.

8. *P. CAMPANULARIA* Gray -- California Bluebell -- With large blue flowers in secund racemes. Leaves suborbicular-ovate. Raceme lax, borne opposite a leaf. Pedicel longer than the fruiting calyx. All summer. Sometimes cultivated and rarely self-reseeding in gardens: Fort Saskatchewan. -- Alta, wUS.

5. ROMANZOFFIA Cham.

Style not lobed. Resembling some Saxifraga in habit. Cymes raceme-like, but the racemes secund.

1. *R. sitchensis* Bong. -- Petioles dilated at base, becoming almost bulbous in age. Leaves reniform, coarsely crenate. Flowers white on long pedicels in bractless racemes. Mid summer. Wet, alpine or subalpine cliffs. -- sAka, swAlta-BC, US.

Order 55. BORAGINALES

Like the last, the flower 5-merous and with 5 stamens, but the ovary of only 2 carpels, but 4-locular because of false partitions.

105. BORAGINACEAE (BORAGE FAMILY)

Ovary deeply 4-lobed, each lobe maturing into a separate nutlet. Herbs, often rough pubescent, even setose-hispid or almost acicular-hispid in many species. Flowers in scorpioid cymes.

a. Achenes catchy by hooked bristles.

b. Cymes bractless 2. Cynoglossum

bb. Flowers subtended by bracts 3. Lappula

aa. Achenes glabrous to tuberculate, rarely puberulent.

c. Flowers axillary or in leafy cymes Group A
PHACELIA 48

- cc. In bracteolate or bractless cymes,
sometimes leafy towards the base.
- d. Cymes bracteolate Group B
- dd. Bractless or bracteolate
towards the base only Group C

Group A

Flowers axillary, the upper leaves often reduced, but at least overtopping the calyx. Racemes irregularly leafy and bracteolate, or bractless in Plagiobotrys.

- a. Flowering leaves mostly clustered in
2's or 3's 7. Asperugo
- aa. Alternate.
 - b. Annual with puberulent
achenes 4. Plagiobotrys
 - bb. Achenes glabrous; mostly
perennials.
 - c. Corolla lobes rounded;
style included 14. Lithospermum
 - cc. Corolla lobes acute;
style longer, exserted 15. Onosmodium

Group B

Flowers in cymes bracteolate to the tip. Lower bracts sometimes leaf-like.

- a. Pedicels recurved and longer
than the calyx 9. Borago
- aa. Flowers erect or ascending, borne
on shorter pedicels.
 - b. Flowers white and less than
1 cm long 5. Cryptantha
 - bb. Blueish and mostly longer.
 - c. Flowers in an elongating
raceme of cymes 16. Echium
 - cc. Branching not so regular
and more or less dichotomous.
 - d. Calyx lobes shorter
than the tube 11. Nonea
 - dd. More than twice longer than
the short tube 10. Lycopsis

Group C

Cymes bractless or only the lower flowers bracted.

- a. Branches all or mostly internodal
or opposite the leaves 8. Symphytum
- aa. Branches axillary.
 - b. Flowers blue.
 - c. Racemes elongate and
quite bractless 12. Myosotis

- cc. Cymes congested and more or
less clearly bracted at base 13. Mertensia
- bb. White or yellowish.
- d. Plant glabrous 1. Heliotropium
- dd. Rough hirsute.
- e. Corolla constricted at
the throat and with 5
lobes which practically
occlude the throat 5. Cryptantha
- ee. Corolla open at the
throat 6. Amsinckia

1. HELIOTROPIUM L.

HELIOTROPE

Fruit shallowly lobed. Stigma sessile at the junction of the grooves.

1. H. curassavicum L. var. obovatum DC. (H. spathulatum Rydb.) -- On the shores of playas, a somewhat fleshy herb with secund racemes of white flowers. Somewhat depressed. Leaves ovate to lanceolate, mostly spatulate. Summer. Infrequent on dried up shores of alkaline sloughs. -- swMan-swS-sAlta, (US).

The typical South American phase is smaller by about half, the leaves 2-5 mm wide, the flowers \pm 2 mm wide.

2. CYNOGLOSSUM L.

HOUND'S TONGUE

Achenes attached near their summit and widely spreading, forming a fruit much wider than high. Achenes catchy by hooked spines.

- a. Stem very leafy to the base of
the inflorescence 1. C. officinale
- aa. Leafless or nearly so in the
upper half 2. C. boreale

1. C. OFFICINALE L. -- Hound's Tongue, Sheep-Bur (Langue de chien, Herbe d'Antal) -- Flowers deep red; achenes catchy, flattish, covered with hooked prickles on both faces. Rough hairy perennial. Branches curved inward, pedicels curved outward. Calyx 5-8 mm high. Summer. Infrequent weed of barnyards and sheltered spots frequented by cattle. -- NS, NB-BC, US, Eur.

2. C. boreale Fern. -- Wild Comfrey -- Quite leafless and bractless in the inflorescence and in the upper 1-(2) dm of the stem. Calyx \pm 2 mm high. Flower mauve, drying blue. Early summer. Very sporadic in dry woods. -- NF, NS, NB-BC, US.

3. LAPPULA Moench

STICKSEED

Like the last, the achenes are catchy by hooked spines, but said achenes are attached at the base, they are higher than broad and the spines are all or mostly peripheral.

- a. Pedicels erect, shorter than the bractlets .. 1. L. echinata

HELIOTROPIUM

50

- aa. Spreading or reflexed; upper bractlets very short or lacking.
 - b. Flower 1.5-3.0 mm across; calyx lobes acutish 2. L. deflexa
- bb. Larger, 4-12 mm wide.
 - c. Spines all peripheral, or sometimes with 1-2 dorsal spines; biennial 3. L. floribunda
- cc. Achene with both peripheral and dorsal spines; perennial with longer style 4. L. diffusa

1. L. ECHINATA Gilib. var. ECHINATA (L. Myosotis Moench) -- Stickseed, Maiden-Lip (Bardanette) -- Achenes very catchy by means of a double peripheral row of acicules with harpoon-shaped points. Branchy annual, rough-hirsute throughout. Flowers small, blue, sometimes white. First half of summer. Frequent weed of light, disturbed soils, mainly roadsides. -- sMack-Y-(Aka, NF, NS-NB)-Q-(O)-Man-BC, (US, Eur) -- Var. occidentalis (Watson) Boivin (L. occidentalis (Watson) Greene; L. Redowskii (Horn.) Greene) -- Acicules fewer, forming a single peripheral row. Sandy soils and disturbed ground. -- sMack-(Y)-Aka, (sMan)-S-Alta-(BC, US, SA, Eur) -- F. cupulata (Gray) Boivin -- Acicules fused at base for 1/3-1/2 of their length, adding a peripheral wing to the achene. Local: Medicine Hat. -- seAlta-BC, (US).

2. L. deflexa (Wahl.) Garcke var. americana (Gray) Greene (L. americana (Gray) Rydb.; Hackelia americana (Gray) Fern.; H. deflexa (Wahl.) Opiz var. americana (Gray) Fern. & Johnst.) -- Sheep-Bur (?) Blue Bur (?) -- Catchy fruits on reflexed pedicels in second racemes. Leaf pubescence upwardly directed. Flowers small, 1.5-3.0 mm wide, and usually blue. Achene bearing all or nearly all its acicules in a single peripheral row. First half of summer. Shaded banks. -- sMack, NB-BC, US.

We are not quite sure that the two vernacular names do actually refer to this species. The typical phase is European and has larger flowers, 3-6 mm wide.

3. L. floribunda (Lehm.) Greene (Hackelia floribunda (Lehm.) Greene) -- Stickweed -- Like the last, but the larger flowers and fruits on shorter branches. Leaf pubescence upwardly directed on the upper face, but on the lower face directed upwards above the middle, downwards below the middle. Style short and inconspicuous, 0.2-0.3 mm long. Achene 4-6 mm long. Early summer. Shaded places near water. -- sAka, S-Alta-(BC), US.

Commonly confused with other species and genera, especially with L. deflexa, but the arrangement of the pubescence on the leaves is apparently very unusual, if not unique. Native in our area, but introduced in Alaska.

4. L. diffusa (Lehm.) Greene (Hackelia Jessicæ (McGregor) Brand) -- Acicules both dorsal and peripheral. Leaf pubescence

variable. Style \pm 1 mm long and reaching to the summit of the calyx lobes after anthesis. Flowers white or blue. Early to mid summer. Edge of mountain woods. -- swAlta-sBC, wUS.

4. PLAGIOBOTRYS Fischer & Meyer

Achenes glabrous or merely puberulent and the corolla not constricted at the throat. Otherwise resembling Lappula and Cryptantha.

1. P. Scouleri (H. & A.) Johnston var. penicillatus (Greene) Cronq. (P. scopulorum (Greene) Johnston; Allocarya californica AA.) -- Flowers axillary, subtended by linear leaves many times longer. Branchy and strigose annual. Flowers small and white, mostly 1-2 mm wide, usually overtopped by the calyx lobes. Achenes puberulent and finely glandular. Summer. Playas and saline shores. -- (Y)-Aka, (swMan)-S-Alta-(BC), US.

The typical phase is more western; its flowers are mostly 2-4 mm wide and its achenes are glabrous.

5. CRYPTANTHA Lehm.

Flowers small and white in \pm bracteolate cymes.

a. Perennial with a raceme of cymes 1. C. nubigena
aa. Diffusely branched annuals.

b. Cymes bracteolate throughout 3. C. minima
bb. Only the lowest flower(s)

with a bract 2. C. Fendleri

1. C. nubigena (Greene) Payson var. celosioides (Eastw.) Boivin (C. Bradburyana Payson; C. sobolifera AA.) -- White flowers with a yellow center. Coarsely hirsute perennial from a heavy rosette. Basal leaves spatulate-lanceolate to oblinear, 5-8 mm wide, the stem-leaves narrower. Corolla 7-11 mm wide. Late spring and early summer. Foothill steppes and Writing-on-Stone. -- sAlta-sBC, US -- Var. Macounii (Eastw.) Boivin (C. celosioides (Eastw.) Payson var. Macounii (Eastw.) Boivin; C. Macounii (Eastw.) Payson; Oreocarya aperta AA.; O. glomerata AA.; O. Macounii Eastw.) -- Generally smaller. 1.0-2.5 dm high. Rosette leaves 5 mm wide or less, oblinear to long linear, the stem leaves narrower still. Flowers 6-8 mm wide. More widespread on rolling steppes. -- sS-sAlta, US.

Var. celosioides (Eastw.) stat. n., Oreocarya celosioides Eastw., Bull. Torr. Bot. Club 30: 240, 1903.

Var. Macounii (Eastw.) stat. n., Oreocarya Macounii Eastw., Bull. Torr. Bot. Club 40: 480, 1913; Cryptantha Macounii (Eastw.) Payson, Ann. Miss. Bot. Gard. 14: 303, 1927.

Var. nubigena resembles mainly var. celosioides because of its wider spatulate leaves, etc., but it differs by its nutlet which is smooth on both faces or at least on the ventral face, while our two varieties have nutlets rugose or tuberculate on both faces. This var. nubigena has already been reported

as C. sobolifera Payson from the Waterton area by Breitung 1957 and Moss 1959. Of the corresponding specimens Moss 3133 (ALTA, DAO) is in flower and its varietal determination is open to question, while Breitung 15712 & 17120 (ALTA) have been revised to var. celosoides.

2. C. Fendleri (Gray) Greene (C. crassipetala AA.; C. Kelseyana Greene) -- Minute white flowers usually overtopped by the pubescence. Hairs stiff and almost acicular, forming yellow tufts at the tip of the branches. Achenes small, shiny, gray with purple spots, shorter than both the calyx lobes and the longer hairs. First half of summer. Wind eroded sands. -- (seAka), swS-BC, US.

3. C. minima Rydb. -- Similar, the cymes bracted to the tip, the bracts mostly longer than the calyx. Sepals perhaps a bit longer, but mainly with the midnerve whitish, very thick and prominent, indurated. Early summer. Perhaps an overlooked native of eroded soils or possibly only an adventive at Medicine Hat. -- seAlta, US.

6. AMSINCKIA Lehm.

Cymes bractless and the corolla not constricted at the throat. Otherwise much like Cryptantha.

1. A. MENZIESII (Lehm.) Nels. & Macbr. (A. barbata Greene; A. idahoensis M.E. Jones; A. intermedia Fisch. & Mey.; A. lycopsoides Lehm.; A. tessellata AA.) -- Somewhat similar to Cryptantha Fendleri, especially the pubescence, but the flowers larger. Corolla \pm 7 mm long, overtopping the pubescence. Calyx lobes elongating in fruit, becoming 4-6 mm long. Summer. Infrequent railway weed. -- Y-Aka, sMan-seS-BC, US, Eur.

A collection reported as Amsinckia tessellata Gray, Stonehouse, Neepawa, 1911 (WIN), proved to have smaller flowers and shorter calyx lobes than expected and was accordingly revised to A. Menziesii. The other collections of the latter in our area come from Estevan (DAO), Hillcrest (ALTA), South Edmonton (ALTA), and Coaldale (DAO).

7. ASPERUGO L.

MADWORT

Calyx enlarging in fruit, with 10 lobes, the alternate ones reflexed and emarginate at tip.

1. A. PROCUMBENS L. -- Madwort (Portefeuille, Rapette) -- Scrambling by its stiff and reflexed hairs on the angles of the stem. Internodes dimegueth, a very long one alternating with 1 or 2 very short ones, the oblanceolate leaves thus nearly clustered in 2's or 3's. Flowers solitary and arising in the forks or from slightly outside the axils. First half of summer. Rare weed: Manitou, Banff. -- G, Y-Aka, O-Man, Alta-BC, nUS, Eur.

8. SYMPHYTUM L.

COMFREY

Achene smooth, dilated at base into a thick peripheral rim.

- a. Leaves long decurrent, the upper ones sessile 1. S. officinale
 aa. All leaves petiolate, not decurrent 2. S. asperum

1. S. OFFICINALE L. -- Comfrey (Langue de vache, Grande Consoude) -- A coarse herb with long tubular flowers in bractless cymes. Limb decurrent on the petiole and for nearly the whole length of the internode. Stem retrorse-hirsute. Calyx 7-9 mm long in flower, the lobes triangular lanceolate. Corolla 15-18 mm long, whitish or sometimes pinkish. Late spring to mid summer. Rare escape from cultivation: Golden Spike. -- NF, NS, NB-O, Alta-BC, US, Eur.

2. S. ASPERUM Lepechin -- Similar and not always clearly distinct because of frequent cultigen hybrids. Stem pubescent with recurved hairs. Petiole of upper leaves sometimes winged and short-decurrent. Calyx 3-5 mm long at flowering, elongating. Flowers 10-15 mm long, pink and turning blue. Early summer. Also a rare escape: Brandon. -- (NF), NS-PEI, Q-Man, BC, (US), Eur.

More than half of the Canadian specimens examined were variously intermediate between our two species, as if the original cultivated stock was mostly of hybrid origin. Such hybrids could be called S. uplandicum Nyman (= S. peregrinum AA.), but we have not attempted to implement this distinction.

9. BORAGO L.

BORAGE

Corolla open, rotate, dissected nearly to the base.

1. B. OFFICINALIS L. -- Borage, Ox-Tongue (Bourrache, Langue de boeuf) -- Large flowers on long, recurved pedicels. Spinulose-hispid throughout. Upper leaves clasping. Calyx lobes elongating to 1-2 cm. Mid to late summer. Sometimes cultivated and on occasion weedy in Manitoba: Ninette, Brandon, Saint-Norbert, Argyle, Portage; more rarely so westward: Melfort, Fort Saskatchewan. -- SPM, NS-Alta-(BC, US), Eur.

10. LYCOPSIS L.

BUGLOSS

Corolla asymmetrical, the tube being slightly curved.

1. L. ARVENSIS L. -- Bugloss (Chaudronnette, Face de loup) -- Non-descript weed, spinulose-hispid throughout. Pedicels mostly internodal or somewhat opposite the bracts. Corolla blue, about 8 mm long. Calyx lobed nearly to the base. Larger leaves somewhat undulate at margin and with coarser hairs on the projecting points. Summer. Infrequent weed. -- (NF) NS-Alta, US, Eur, (SA).

Known in Manitoba only from Carberry.

11. NONEA Medicus

Corolla without appendages at the throat.

1. N. VESICARIA (L.) Reich. -- Much like the last. Calyx tubular, the tube longer than the lobes. Flowers mostly axillary. Pubescence not so coarse and somewhat glandular. Mid summer. Rare weed: Swallow. -- Alta, (neUS), Eur, Afr.

12. MYOSOTIS L.

Flowers in elongate and bractless cymes; calyx tube well developed and about as long as the lobes.

- a. Calyx pubescence of straight hairs.
 - b. Corolla lobes 2-4 times longer than the calyx lobes 1. M. scorpioides
 - bb. About the same size 2. M. laxa
- aa. At least in part of incurved hooked hairs.
 - c. Perennial; flower 4-8 mm wide 3. M. sylvatica
 - cc. Annual or biennial; flower smaller 4. M. arvensis

1. M. SCORPIOIDES L. -- Forget-me-not (Ne m'oubliez pas)-- Like the next with much larger flowers. Perennial. Cymes bractless. Calyx lobes shorter than the tube, Corolla 5-10 mm wide. Style elongate and just about equalling the top of the calyx lobes right after the fall of the corolla. Summer. Rare weed of cultivation, naturalized in wet places: Camp Morton. -- (Aka), NF-SPM, (NS)-PEI-Man, BC, US, Eur.

2. M. LAXA Lehm. -- Forget-me-not (Petit bleu, Grémillet) -- Blue flowers in lax and secund raceme-like cymes, bractless except toward the base. Annual or biennial. Pubescence of straight and strigose hairs. Calyx lobes about as long as the tube. Style short and not readily observed, overtopped by the achenes. Summer. Rare adventive of wet places: Lake Isle. -- (NF, NS-NB)-Q-O, Alta-BC, (US, SA), Eur.

3. M. sylvatica Hoffm. var. alpestris (F. W. Schmidt) Koch (M. alpestris F. W. Schmidt) -- (Oreille de souris, Ne m'oubliez pas) -- Blue flowers with a yellow eye in a crowded cyme, elongating in fruit. Calyx pubescence mostly of straight hairs. Early to mid summer. Alpine slopes and ridges. -- wMack-Aka, O, swAlta-BC, US, Eur -- F. Eyerdamii Boivin -- Flowers white. Local: Waterton. -- sAka, swAlta.

Native with us, but present in the East only as an escape from cultivation.

4. M. ARVENSIS (L.) Hill -- Flowers less than 2 mm wide in more elongate bractless cymes. More diffusely branched. Calyx pubescence mostly of incurved-hooked hairs. Early to mid

summer. Rare weed, usually in shaded places: Brandon, Bjorkdale. -- (G, Aka, NF)-SPM, (NS-NB)-Q-S, swBC, (neUS, Eur).

13. MERTENSIA Roth

Inflorescences short, the pedicels $\frac{1}{2}$ clustered and mostly bractless.

- a. Herbage hirsute throughout 3. M. paniculata
- aa. Glabrous or the leaves ciliate
and short strigose above.
 - b. Very strongly glaucous
maritime plant 1. M. maritima
 - bb. Green to slightly glaucous.
 - c. Perennial from a taproot;
flowers 1.0-1.5 cm long 2. M. lanceolata
 - cc. From a subglobular tuber;
flowers 1.5-2.5 cm long 4. M. longiflora

1. M. maritima (L.) S.F. Gray -- Blue Bonnet, Ice-Plant (Sanguine de mer) -- Very glaucous herb forming rosettes of prostrate stems on seashores. Somewhat fleshy and glabrous. Corolla 4-5 mm long, campanulate, blue. Early summer. Gravely beaches at high tide. -- G-Mack-(Y)-Aka, L-SPM, NS, NB-nMan, wBC, neUS, nEur.

More northern plants (including ours) are gradually smaller and have been segregated on this basis as var. tenella Fries.

2. M. lanceolata (Pursh) A.DC. var. lanceolata (M. linearis Greene) -- Somewhat fleshy herb with blue flowers mostly in small bractless clusters at the end of the branches. Tufted perennial, the stems (1)-2-3-(4) dm long. Leaves and calyx lobes ciliate, otherwise glabrous or the leaves short-scabrous above. Mid spring to early summer. Steppes, infrequent. -- sS-swAlta-(BC), cUS.

Known in Alberta from a single collection by McCalla in 1932 at Magrath (ALTA). An early report by Campbell 1900 was based on a Canmore (MTMG) collection which is apparently a depauperate specimen of M. paniculata.

In a more southern var. secundorum Cock. the leaves are pubescent on both faces. For var. Drummondii see Additions.

3. M. paniculata (Aiton) G. Don var. paniculata (M. pilosa (Cham.) G. Don) -- Blue-flowered herb forming showy colonies in forest openings. 4-6-(10) dm high. Basal leaves cordate and very scabrous on both faces, with nearly parallel nervation, passing to the upper lanceolate leaves. Flowers in a terminal panicle of small, nodding clusters. Calyx lobes pilose dorsally. Corolla 1.5-(2.0) cm long. Early summer. In and around woods. -- K-Aka, wcQ-BC, US.

West of us, var. borealis (Macbr.) Williams has the leaves glabrous at least above. And to the northwest of us var. alaskana (Britton) Williams has narrower leaves glabrous

below, the upper ones narrowly lanceolate, and its calyx lobes merely ciliate, being otherwise glabrous. Some intermediates occur which resemble var. paniculata but for the calyx lobes glabrous dorsally; these are often identified var. Eastwoodae (Macbr.) Hultén.

4. M. longiflora Greene -- Resembling M. lanceolata, but smaller and showier. Stems mostly erect and solitary, 1-2-(3) dm high. Flower tubular, fewer and larger, usually in a single terminal cyme. Early summer, montane and piedmont prairies in Waterton. -- swAlta-sBC, wUS.

14. LITHOSPERMUM L. GROMWELL, PUCCOON

Flowers yellow and axillary, usually showy. Style shorter than the corolla. Root with a deep red pigment.

- a. Annual with small, pale yellow flowers 1. L. arvense
- aa. Perennial.
 - b. Flowers large, stem usually 1-3 dm long.
 - c. No axillary fascicles 5. L. canescens
 - cc. Branchy and with numerous axillary fascicles 4. L. incisum
 - bb. Flowers smaller; stem taller.
 - d. Lateral nerves lacking or very weak 3. L. ruderales
 - dd. Larger leaves with conspicuous lateral nerves deeply impressed above 2. L. officinale

1. L. ARVENSE L. -- Bastard Alkanet, Wheatthief (Charrée) -- Branches few and a flower in most of the forks. The latter tending to trichotomous. Lower leaves narrowly oblanceolate, less than 5 mm wide, the upper leaves sometimes wider. Flowers otherwise borne at the edge of the leaf axils. Corolla shorter than, to barely longer than, the calyx, bicolour, yellow with a broad bluish-black ring below the middle. Achenes pale brown, abundantly and irregularly pitted. Mid spring to early summer. Rare weed: Winnipeg, Alexander. -- (SPM), NS, O-sMan, BC, US, Eur, Oc.

2. L. OFFICINALE L. -- Gromwell (Herbe aux perles, Graïnes de lutin) -- Conspicuous in fruit, the latter a cluster of 4 shiny, white plump and hard achenes. Leaves narrowly lanceolate, broadest towards the middle, conspicuously nerved. Nerves few, deeply impressed above, strongly rugose below. Flowers nearly all axillary. Forks without a central flower, except perhaps 1-2 of the upper forks. Corolla small, less than twice as long as the calyx. Achenes 2-3 mm long. Late spring and early summer. Rare weed: High Bluff. -- NB-sMan, wBC, nUS, Eur.

- 3. L. ruderales Douglas -- Puccoon -- Similar to the last,

but the leaves broadest very near the base and tapered to the tip. Branches usually shorter than the leaves. Flowers yellow, 6-9 mm long, about twice as long as the calyx. Achenes 4-6 mm long. Early summer. Foothills and montane prairies: Cypress Hills, Writing-on-Stone and Rockies. -- swS-cCB, wUS.

4. L. incisum Lehm. (L. angustifolium Mx.; L. linearifolium Goldie; L. mandanense Sprengel) -- Flower longest; fruit on a recurved pedicel. Becoming \pm branchy. Leaves long linear, acute. Early corollas 1.5-3.5 cm long. Fruits arising mostly from insignificant cleistogamous flowers. Late spring. Steppes on hillsides. -- sO-cBC, US, (CA).

5. L. canescens (Mx.) Lehm. -- Cowslip, Indian Paint -- Rather showy tufted perennial with yellow flowers fading orange. Stems mostly 1-3 dm, with 1-2 dichotomous forks in the upper part, otherwise simple. Leaves \pm lanceolate, rounded at tip. Flowers 1.0-1.5 cm long, in the forks and axillary with the upper leaves. Late spring and early summer. Sandy prairies. -- O-sS, US.

15. ONOSMODIUM Mx.

FALSE GROMWELL

Axillary flowers with long protruding styles.

1. O. molle Mx. var. hispidissimum (Mack.) Cronq. (O. hispidissimum Mack.) -- Extremely rough-hirsute perennial, tufted. Leaves broadly to narrowly lanceolate. Lateral nerves 2-4, very conspicuously and nearly parallel to the midnerve. 7-12 dm high. Corolla 12-16 mm long, greenish-white. Achene contracted at base into a sharply defined collar about 0.3 mm high. First half of summer. Edge of woods. -- swO-sMan, cUS -- Var. occidentale (Mack.) Johnston (O. occidentale Mack.) -- Achene without basal collar. Plant often smaller, 4-10 dm high. Mostly river valleys. -- swMan-seS-swAlta, cUS.

Our two varieties may be positively identified only when fruiting. When in flower they can still be recognized as belonging to ssp. hispidissimum (Mack.) stat. n. (O. hispidissimum Mack., Bull. Torrey Bot. Club 32:500, 1905) by their coarse pubescence, \pm spreading and strongly hispid, almost acicular. By way of contrast, the more southern ssp. molle is glabrous or bears a shorter and softer pubescence. In Gleason 1952 the pubescence descriptions of O. molle and O. occidentale seem to have been inadvertently inverted.

16. ECHIUM L.

VIPER'S BUGLOSS

Corolla irregular, somewhat bilabiate. Style bifid for about 0.5-1.0 mm.

- a. Calyx lobes 4-5 mm long,
elongating to 6-8 mm 1. E. vulgare
- aa. Lobes 9-12 mm long 2. E. Lycopsis

1. E. VULGARE L. var. VULGARE -- Blue Devil, Blueweed
ONOSMODIUM

(Herbe bleue, Herbe piquante) -- Spinulose-hispid, blue-flowered herb with a terminal raceme of arching cymes. Flower about 1 cm long, pubescent outside, with 4 long-exserted stamens. Second half of summer. Infrequent and unpleasant weed. -- NF, NS, NB-BC, US, (SA), Eur.

Known from Alexander, Regina, Hoosier, Frank, High River and Lundbreck.

2. E. LYCOPSIS L. -- (E. plantagineum L.) -- Similar but the calyx longer, the flowers larger and the branching not so regular, rather dichotomous. Corolla 1.5-2.5 cm long, pubescent on the sutures only, with only 2 exserted stamens. Summer. Rare weed: Brandon. -- O-sMan, (US, Eur).

The Ontario record is from Vineland (OAC).

Order 56. LAMIALES

Single family with us. Other families have alternate leaves and the ovary is barely lobed.

106. LABIATAE

(MINT FAMILY)

Like the Boraginaceae, the ovary deeply 4-lobed and maturing into 4 achenes. But the leaves opposite, the stem square and the flower bilabiate.

a. Flowers all or mostly in one or more terminal inflorescences.

b. Flowers in a globose head 15. Monarda

bb. Elongated raceme Group A

aa. Axillary.

c. Solitary or in axillary

racemes 2. Scutellaria

cc. In axillary glomerules.

d. Leaves palmatifid 12. Leonurus

dd. Less dissected,

crenate to serrate Group B

Group A

Flowers clearly disposed in one or more terminal inflorescences. Bracts overtopped by the flowers, or sometimes the lower ones larger and grading into the leaves.

a. Calyx strongly bilabiate, the upper lobe 3-toothed, the lower bilobed.

b. Flowers in dense spikes; only

the calyx lobes protruding beyond

the large subtending bract 8. Prunella

bb. Spikes lax; bract smaller and

merely covering the base of

the calyx 14. Salvia

aa. Weakly if at all bilabiate, one lobe

sometimes larger than the others.

c. Inflorescence a raceme of

opposite flowers 9. Physostegia

ECHIUM

- cc. Raceme of opposite clusters.
 - d. Bracts strongly contrasted with and much shorter than the leaves.
 - e. Perennial; spike symmetrical.
 - f. Corolla strongly bilabiate ... 4. Agastache
 - ff. More obviously 4-lobed than bilabiate 20. Mentha
 - ee. Annual; spikes secund 21. Elscholtzia
 - dd. Lower bracts grading into the upper stem leaves.
 - f. Leaves narrow and entire 18. Hyssopus
 - ff. Crenate to dentate.
 - g. Upper lip of the corolla not obvious 1. Teucrium
 - gg. Both lips conspicuous.
 - h. Upper calyx lobe at least twice as broad as any of the other 4 7. Dracocephalum
 - hh. Upper calyx lobe similar to at least the next two.
 - i. Flowers white 5. Nepeta
 - ii. Pink or purplish 13. Stachys

Group B

Flowers in axillary clusters, overtopped by the subtending leaves, not forming obvious terminal inflorescences, although sometimes confined to the upper leaves.

- a. Herb catchy by its calyx with 10 lobes hooked at tip 3. Marrubium
- aa. Not catchy.
 - b. Calyx strongly bilabiate.
 - c. Upper calyx lobe contrasted with the other 4 and about 3 times wider than any of them 7. Dracocephalum
 - cc. The 3 upper lobes contrasted with the lower 2.
 - d. Lower lobes at least twice longer than the upper lobes, the latter reduced to mere teeth 17. Melissa
 - dd. Lobes subequal, but the lower 2 subulate and the upper much larger 16. Hedeoma
 - bb. Weakly if at all bilabiate and the calyx lobes all similar.
 - e. Corolla weakly bilabiate, more obviously 4-5-lobed.

- f. Stamens 2; flowers
sessile 19. Lycopus
- ff. Stamens 4; flowers
pedicellate 20. Mentha
- ee. Strongly bilabiate.
- g. Calyx tube many times longer
than the teeth 6. Glechoma
- gg. Tube about as long to shorter.
- h. Calyx lobes with spinulose
and glabrous tips 10. Galeopsis
- hh. Herbaceous and pubescent
to tip 11. Lamium

1. TEUCRIUM L.

GERMANDER

Corolla slit along the upper side and its upper lip not obvious, being reduced to two lobes on the lower lip.

1. T. canadense L. var. occidentale (Gray) McCl. & Epl. (T. occidentale Gray, var. boreale (Bickn.) Fern.) -- Wood-Sage, Head-Betony -- Flower without upper lip but with a long lower lip, the style and stamens long protruding and nearly erect. Villous herb. Calyx more or less purplish, its lobes deltoid, the upper 3 obtuse, the lower 2 acuminate. Mid summer. Wet prairies and shores, infrequent. -- Q-S (Yorkton, Lumsden, Cypress H.), BC, US, (CA).

Ours have glandular-pilose calices and the pubescence is longer on the stem and lower leaf surfaces, the hairs 0.5-1.0 mm long, and spreading to reflexed. In the more eastern typical phase the herbage is non glandular and the shorter and recurved hairs are mostly 0.2 mm long.

2. SCUTELLARIA

SKULLCAP

Calyx strongly bilabiate, its lips entire and the upper lip with a strong transverse protuberance on the upper side.

- a. Flowers in axillary and terminal
racemes 3. S. lateriflora
- aa. Solitary in the axils of the main
stem leaves.
- b. Flower 1.6-2.5 cm long 1. S. galericulata
- bb. Smaller, 1 cm long or
slightly less 2. S. parvula

1. S. galericulata var. pubescens Bentham (var. epilobiiifolia (A. Ham.) Jordal; S. epilobiifolia A. Ham.) -- Red Tops, Skull-Cap (Toque, Tertiansaire) -- Herb with 2 large, blue, sigmoid flowers at each node, usually both flowers facing the same side. Corolla (16)-18-22-(25) mm long, nearly white on the lower side. Mainly mid summer. Wettish places and shores. -- Mack-Aka, L-SPM, NS-BC, US, Eur.

The typical european phase has somewhat shorter flowers,

13-18 mm long, and the herbage is glabrous or with shorter pubescence.

2. S. parvula Mx. var. leopardii (Epling) Fern. -- Shallowly rooted, the rhizome conspicuously moniliform, the segments about 1 cm long and thinly linked. Usually 1-2 dm high and simple. Herbage finely puberulent with incurved hairs, not glandular. Leaves smallish, about 1 cm long, whitened below, the nerves strongly rugose, the middle and upper leaves mostly about 3 times longer than wide. Early summer. Peaty soil over rocky outcrops, rare: Rennie. -- seMan, US.

A single canadian collection known: J. Looman 8830, 4 mi. W. of Rennie, 7 July 1964 (DAO).

Grades freely into the more eastern typical phase which is pilose and glandular, the pilosity especially abundant and obvious on the angles of the stem and the lower leaf surfaces; leaves commonly broader, mostly ovate.

S. parvula Mx. was reported from Saskatchewan by Hooker 1838 and Macoun 1884, but this has never been confirmed and seems rather unlikely. See comments under Rosa nutkana.

3. S. lateriflora L. var. lateriflora -- Mad-Dog-Skullcap -- Flowers opposite, in secund racemes. Petioles elongate. Racemes with small leaves near the base, grading into bracts upwards. Corolla blue, 6-8 mm long, nearly straight. Mid summer. Grassy shores. -- NF, NS-S-(Alta)-BC, US.

The more western var. Grohii Boivin has smaller flowers, the corollas (4.5)-5.0-5.5-(6.0) mm long.

3. MARRUBIUM L.

HOREHOUND

Calyx lobes 10. Corolla strongly bilabiate. Style and stamens included in the tube.

1. M. VULGARE L. -- Horehound, White Horehound (Marrube, Bonhomme) -- Herb catchy by the recurved tips of its calyx lobes. Felty-lanate and partly white-lanate throughout. Leaves flabellate, the palmate nervation deeply impressed above, strongly rugose below. Flowers white, in dense clusters in the axils of the upper leaves. Summer. Cultivated and rarely spreading to dry places: Shellbrook. -- (Aka), NS, Q-O, S, BC, US, SA, Eur, (Afr).

4. AGASTACHE Clayton

GIANT HISSOP

Calyx regular, but the corolla bilabiate and the 4 stamens long exserted.

1. A. Foeniculum (Pursh) Ktze. (A. anethiodora (Nutt.) Britton; A. scrophulariifolia AA.) -- Calyx with at least the lobes blue. Showy virgate herb with a bluish inflorescence, sometimes branchy. Leaves ovate, strongly discolour, almost white below. Corolla blue. Mid summer. Chernozems. -- sMack, NB-BC, US -- F. Bernardii Boivin -- A two-toned flower, the calyx lobes pink, the corolla white. Local. -- Q, S -- F.

candida Boivin -- Calyx lobes and corolla white. Local. --
Man-S.

5. NEPETA L.

CAT-MINT

Calyx nearly regular, but oblique at the throat. Corolla bilabiate, the stamens not exerted beyond the corolla lobes.

1. N. CATARIA L. -- Catnip, Catmint (*Herbe à chats, Chataire*) -- Soft-hairy herb with cordate leaves. Leaf-teeth $\frac{1}{2}$ rounded. Flowers white, mostly in a terminal racemose inflorescence, but also in smaller inflorescences terminating short branches. Mid summer. Cultivated and sometimes escaped, usually in shaded places. -- NF, NS-BC, US, Eur, (Afr).

Previous Alaska reports by Hultén 1949 and Anderson 1950, queried by Boivin 1966, were based on an Anderson collection at Sitka. In 1968 a loan request to ISC failed to produce the expected specimen. Accordingly we now assume that the substantiating sheet was in the interval revised to some other genus, hence the restricted range quoted above.

6. GLECHOMA L.

GROUND-IVY

Much like the last, but the flowers in small axillary clusters.

1. G. HEDERACEA L. (*Nepeta hederacea* (L.) Trevisan) -- *Scarlet Runner*, Ground Ivy (*Lierre terrestre, Lierre sauvage*) -- Creeping and carpet-making herb with opposite and reniform leaves. Stem rooting at the nodes. Leaves crenate, punctate below in dark green. Flowers blue. Late spring to late summer. Cultivated and readily spreading to shaded places. -- (Aka), NF-SPM, NS-BC, US, Eur.

7. DRACOCEPHALUM L.

DRAGON-HEAD

Calyx lobes dimigueth, the upper one 2-3 times as broad as any of others, the latter similar to one another.

- a. Flowers in dense terminal inflorescence 1. D. parviflorum
aa. In numerous axillary clusters 2. D. thymiflorum

There is much nomenclatorial confusion between *Dracocephalum*, *Moldavica* and *Physostegia*. The last edition of the Code of Botanical Nomenclature typifies *Dracocephalum* by *D. Moldavica* L. and our treatment follows from that decision.

In 1959 *Lallemantia peltata* (L.) Fisch. & Mey. appeared as a fleeting impurity in experimental plots at Saskatoon (DAO). As this incident did not recur, the species is not considered to be a part, not even a casual part, of our spontaneous flora; we regard such specimens as having been cultivated by inadvertence. As a species it is readily distinguished by its broadly flattened pedicels and its dimorphic leaves in the

inflorescence, the larger ones lanceolate and subentire, the smaller ones suborbicular and coarsely serrate.

1. D. parviflorum Nutt. (Moldavica parviflora (Nutt.) Britton) -- Calyx lobes and leaf teeth stiff and sharp, almost acicular. Annual or biennial with rather dense and fat inflorescences. Flowers pink, slightly exceeding the calyx. Bracts about equalling the calyx, their teeth stiffer and more pungent than either the leaf teeth or the calyx lobes. Summer. Mainly in disturbed soils. -- Mack-Aka, NF, NS, Q-BC, US, (Eur).

2. D. THYMIFLORUM L. (Moldavica thymiflora (L.) Rydb.) -- Upper calyx lobe suborbicular. Nondescript annual or biennial with cordate to oblanceolate leaves, serrate to subentire, darker punctate below. Calyx with small, scattered, glistening glands. Mid spring to mid summer. Infrequent weed of wetish or shaded places. -- Y, O-Alta, (US), Eur.

8. PRUNELLA L.

SELF-HEAL

Calyx bilabiate, the upper lip broadly and crenately 3-lobed, the lower lip of 2 lanceolate lobes.

1. P. vulgaris L. (var. lanceolata (Barton) Fern.) -- Selfheal, Carpenter-Weed (Brunelle, Herbe au charpentier) -- Leaves few, entire or nearly so and mostly oblong. Stem internodes rather elongate, but the peduncle of the compact inflorescence very short. Bracts broad, reniform, cuspidate, ciliate. Calyx often purplish. First half of summer. Shores, sometimes weedy. -- Aka, L-SPM, NS-BC, US, SA, Eur, Oc.

9. PHYSOSTEGIA Benth

Glomerule reduced to a single flower, hence the inflorescence is a raceme of opposite flowers. Calyx regular. Corolla bilabiate with 4 included stamens.

1. P. virginiana L. var. formosior (Lunell) Boivin (P. formosior Lunell; Dracocephalum formosius (Lunell) Rydb.) -- (Cataleptique, Herbe au paralytique) -- Showy herb with a raceme of opposite flowers, pink to red-spotted. Usually virgate with a single terminal inflorescence. Leaves 1.5-4.0 cm wide, rhomboid-lanceolate. Flowers (1.5)-1.8-2.0 cm long. Mid summer. Wet woods and galerie-forests. -- wO-sMan, ncUS -- Var. Ledinghamii Boivin (P. Ledinghamii Russ., Led. & Coupl. [nomen]; Dracocephalum Ledinghamii Russ., Led. & Coupl. (nomen); D. Nuttallii AA.) -- Leaves thickish and smaller, less than 2 cm and mostly around 1 cm wide, oblong-lanceolate, rounded at base. Flowers like the first. Shores. -- sMack, swQ-wO-Alta, ncUS -- Var. parviflora (Nutt.) Boivin (P. parviflora Nutt.; Dracocephalum Nuttallii Britton) -- Flowers smaller, 1.2-1.5 cm long. Leaves like the last. Shores, often somewhat saline. -- sS, BC, US -- Var. elongata Boivin -- Flowers larger, 2-3 cm long. Leaves mostly around 1 cm wide, firm but not thick, lanceolate to narrowly lanceolate, cuneate at base. Local:

Pointe du Chien. -- (NB)-Q-cMan, US.

Sometimes cultivated and rarely escaped. The extension of var. Ledinghamii to Sainte-Anne-de-Bellevue (QFA) in Quebec is based on such an escape incident.

10. GALEOPSIS L.

Calyx more or less regular, with long spinescent lobes. Corolla strongly bilabiate. Flowers in axillary clusters.

- a. Flower pinkish, 1.3-2.0 cm long 1. G. Tetrahit
 aa. Yellow and 2.2-3.5 cm long 2. G. speciosa

1. G. TETRAHIT L. var. TETRAHIT (f. albiflora AA.) -- Hemp-Nettle (Gratte, Chanvre sauvage) -- Herb somewhat pungent, both from the stiff and coarse pubescence and the spinescent calyx lobes. Stem retrorse-hispid, slightly thickened below the nodes when fresh, narrower in drying. Leaves narrowly ovate. Corolla 15-20 mm long, exerted from the calyx by 10-15 mm, usually pale to whitish. Mid summer. Weed of disturbed soils. -- Aka, NF, (NS-PEI)-NB-Man, Alta-BC, Eur -- Var. BIFIDA (Boenn.) Lej. & Court. -- Generally smaller and the corollas shorter, 13-15 mm long, exerted from the tube of the calyx by 1 cm or less, darker coloured, pink to reddish. Much more common. -- Mack, (Aka), L-SPM, NS-BC, US, Eur.

2. G. SPECIOSA Miller -- Day-Nettle -- Flowers larger and yellow, with a purple lower lip. Second half of summer. Rare weed of waste places: Millet, Heatherdown, Fort Saskatchewan. -- Q, cAlta, Eur.

11. LAMIAM L.

DEAD NETTLE

Resembling Galeopsis, but the calyx lobes are pubescent and not so pungent. Lower lip of the corolla reduced to its central lobe, the lateral lobes being more or less vestigial.

- a. Upper leaves sessile,
 semiorbicular 1. L. amplexicaule
 aa. Petiolate and narrowly
 ovate 2. L. album

1. L. AMPLEXICAULE L. -- Henbit, Henbit-Nettle (Pain de poule) -- Upper leaves semiorbicular and sessile in opposite pairs with axillary glomerules of flowers. Annual, branchy from the base. Leaves coarsely crenate, the lower petiolate and broadly ovate. Corolla about 1.5 cm long. Mid summer. Rare weed of shaded places. -- G, (L)-NF-SPM, (NS), NB-O, S-BC, US, Eur, (Afr) -- F. CLANDESTINUM (Rchb.) G. Beck -- Corolla only 2-3 mm long and plugged at the throat with a tuft of white or coloured hairs. More common. -- G, Mack, SPM, NS, O-BC, US, Eur.

2. L. ALBUM L. -- Snowflake (Marachemin, Ortie blanche) -- The pilose upper lip nearly as long as the tube. Stoloniferous and showy in flower, the latter 2-3 cm long. Stem

retorse-hirsute. Leaves triangular-lanceolate. Flower whitish, hairy. Late spring. Sometimes spreading from cultivation: Brandon, Speers. -- (Aka, NB)-Q-S, (US), Eur, (Afr).

12. LEONURUS L.

MOTHERWORT

Calyx lobes spinescent as in Galeopsis, only more so. Upper lip of the corolla entire, lower lip 3-lobed.

- a. Upper leaves trilobed to broadly lanceolate 1. L. Cardiaca
 aa. Palmatipartite to narrowly linear 2. L. sibiricus

1. L. CARDIACA L. -- Motherwort (Herbe piquante, Cardiaire) -- Main leaves palmatifid, the upper mostly trilobed or tridentate. Upper leaves not otherwise dentate and with 3 parallel nerves. Stem, petioles, etc. puberulent, especially on the angles. Flowers in dense axillary and pungent clusters. Mid summer. Cultivated and sometimes escaping to shaded places. -- NS-seS, BC, US, Eur -- Var. VILLOSUS (Desf.) Benth -- Stem, petioles, etc. abundantly long villous. Locally escaped: Dauphin. -- Man, Eur.

2. L. SIBIRICUS L. -- (Gros tombé) -- Quite similar, but the leaves divided nearly to the base and the upper pinnately veined. Densely puberulent throughout. Upper leaves dentate to long linear and entire. Late summer. Rare escape: Du-frost. -- Q-Man, US, SA, Eur, (Afr).

13. STACHYS L.

HEDGE-NETTLE

Calyx lobes undifferentiated. A middling type with bilabiate corollas in poorly defined terminal spikes.

1. S. palustris L. var. homotricha Fern. (var. nipigoniensis Jennings, var. pilosa (Nutt.) Fern.; S. scopulorum Greene) -- Woundwort (Crapaudine, Ortie morte) -- Nondescript Labiate. Stem reflexed-hirsute on the angles, variously pubescent or puberulent on the faces. Leaves \pm oblong-lanceolate, crenately serrate, pubescent on both faces, often villous. Calyx pubescence longer, about as long as (or longer) than the stem pubescence, coarsely hispid with hairs up to 1-3 mm long, mixed with shorter and glandular hairs. -- Mack-Y-(Aka), NB-BC, US -- F. Stevensonis Boivin -- Flowers white. Uncommon -- Man, Alta -- Var. hispidula (Pursh) Boivin (S. aspera AA.; S. hispidula Pursh; S. tenuifolia AA., var. aspera AA., var. hispidula (Pursh) Fern.) -- Stem glabrous on the sides, hirsute on the angles only. Leaves often glabrous above. Calyx hirsute to glandular. -- Q-Man, US.

In so far as we have been able to locate them, specimens from the Otterburne area (QFA) reported by Löve 1959 as var. palustris turned out belong to var. homotricha Fern.

F. Stevensonis f.n., floribus albis. Type: G.A.

Stevenson 1332, Clear Lake, damp gravelly soil in clearing close to lake, July 21, 1957 (DAO). Paratypes: C. Frankton 1235, Cranberry Portage (DAO); G.H. Turner 3654, Fort Saskatchewan (DAO).

Var. hispida (Pursh) stat. n., S. hispida Pursh, Fl. Am. Sept. 2: 407, 1814. There is a gradual transition from S. palustris to S. hispida, and the only character with any degree of reliability is that of the glabreity of the faces of the stem in S. hispida. This does not amount to enough morphological discontinuity to justify specific rank for S. hispida.

14. SALVIA L.

SAGE

Calyx strongly bilabiate, the upper lip of 3 more or less fused lobes, the lower lip of 2 distinct lobes. Stamens reduced to 2. Flowers in lax terminal racemes.

- a. Flowers 2 to a node 1. S. reflexa
 aa. Flowers in opposite glomerules 2. S. nemorosa

1. S. REFLEXA Horn. (S. lanceolata AA.) -- Flowers opposite as in Dracocephalum, but the calyx strongly bilabiate. Branchy annual. Corolla small and inconspicuous, barely longer than the calyx, the latter becoming much larger and strongly 12-nerved in fruit. Late summer and fall. Infrequent weed, adventive from further south. -- swQ-sS, US, (CA, SA, Eur, Oc).

2. S. NEMOROSA L. (S. sylvestris AA.) -- Wood-Sage -- Bracts and calyces purplish. Velvety perennial. Leaves oblong-lanceolate, cordate at base. Bracts suborbicular, strongly cuspidate. Summer. Locally escaped from cultivation: Ninette, Pincher Creek, Stavely. -- sO-(Man), Alta, US, Eur, (Afr).

15. MONARDA L.

HORSE-MINT

Flowers in globose heads. Anthers only 2. Corolla strongly bilabiate, but the calyx regular.

1. M. fistulosa L. var. menthifolia (Graham) Fern. (M. mollis AA.) -- Wild Bergamot (Menthe de cheval, Bergamote sauvage) -- Flowers showy, in large globose terminal heads 4-8 cm wide. Leaves narrowly ovate to lanceolate, short petiolate. Head subtended by about 4 large bracts. Flowers magenta. Mid summer. Frequent on chernozems and in open woods. -- wO-BC, US, (CA) -- F. Russellii Boivin -- Flowers white. Herbage lighter green, the calices not purple-tinged. Local -- Man-Alta.

The late Dr. R.C. Russell was one of the pioneer students of the flora of Saskatchewan. In 1926 he wrote a preliminary checklist which remained in manuscript form. He was coauthor of a List published in 1937, revised in 1944 and 1954. He was one of our regular correspondents and his numerous collections made a substantial contribution to the preparation of this Flora.

The more eastern and typical plants are usually branched and bear more than one head, while the petiole is (6)-8-15-(25) mm long. This eastern material can be subdivided further into three geographical varieties on the basis of pubescence. Our var. menthifolia has somewhat shorter petioles (2)-3-8-(12) mm long and the usually simple stem is normally monocephalous. Our earlier attempts to recognize additional geographical variants of pubescence or flower size within our area proved to be futile.

16. HEDEOMA Pers.

MOCK PENNYROYAL

Stamens 2, like the last two genera, but the inflorescence of axillary glomerules and the calyx bilabiate, being gibbose ventrally and with upcurved lobes. Upper 3 calyx lobes somewhat shorter than the lower two.

1. H. hispidum Pursh (H. hispida sphalm.) -- Corolla small and inconspicuous, not longer than the calyx. Small annual herb, simple to somewhat branchy below the middle. Leave lanceolate to linear, entire or nearly so. Calyx sigmoid. Early summer. Wind eroded hillsides and steppes. -- swQ-sAlta, US.

Of very spotty distribution east of the Missouri Coteau. We know of only one Manitoba collection: Falcon Lake (DAO).

17. MELISSA L.

BALM

Calyx bilabiate, the upper lip merely 3-toothed, the lower lip of 2 lanceolate lobes. Corolla bilabiate, with 4 stamens.

1. M. OFFICINALIS L. -- Balm (Citronelle, Piment des abeilles) -- Ovate leaves dimegueth, the main ones about twice as long as those subtending glomerules of flowers. Stoloniferous perennial. Corolla white and pink, about twice as long as the long pilose calyx. Mid to late summer. Rarely spreading from cultivation: Brandon. -- sO-sMan, BC, US, Eur.

18. HYSSOPUS L.

HYSSOP

Calyx almost regular, the upper 2 lobes slightly shorter than the other 3. Corolla with the lower lip much longer than the upper.

1. H. OFFICINALIS L. -- Hyssop (Hysope) -- Terminal racemes ill-defined and somewhat secund. Tufted perennial. Leaves entire and more or less lanceolate. Flowers deep purple-blue. Mid summer. Sometimes cultivated and rarely spreading to roadsides: Carmel. -- NS, Q-O, S, (US), Eur.

19. LYCOPUS L.

WATER-HOREHOUND

Like the next but the flowers more crowded, sessile, and the stamens only 2. Yellow-punctate, especially on the lower leaf surfaces.

- a. Leaves thickish and sessile 3. L. asper
 aa. Thin and tapered to a short or
 ill-defined petiole .
 b. Calyx lobes 1 mm long or
 less, subacute, overtopped
 by the fruit 1. L. virginicus
 bb. Lobes longer and
 acuminate or subulate 2. L. americanus

1. L. virginicus L. var. pauciflorus Benth (L. uniflorus Mx.) -- Sprig of Jerusalem, Bugleweed -- Flowers white, minute and barely bilabiate, in small axillary clusters. Rhizome tuberous. Long and thin stolons usually present. Bracts minute and inconspicuous. Calyx lobes 5. Second half of summer. Shores. -- Mack, (Aka), L-SPM4, NS-BC, US, (Eur).

Possibly widely distributed in northern Alberta but yet known to us by a single collection: E.H. Moss 10974, Glenevis, wet marshy bog, 1957 (ALTA).

In our northern variety the flowers are mostly pentamerous, the corolla lobes tend to spread and the stamens are usually slightly exerted. Grades further south into the typical phase, tetramerous, the corolla lobes erect and the stamens included. Also the rhizome not tuberous. In the area of sympatry one meets with many intermediates or hybrids which may be called X var. Sherardii (Steele) stat. n., L. Sherardii Steele, Proc. Biol. Soc. Wash. 14; 75. 1901.

2. L. americanus Muhl. var. americanus -- Similar but the rhizome not tuberous and the calyx slightly larger with lobes attenuate into stiff and more or less subulate points. Lower leaves more deeply dissected than the upper and usually pinnatifid. Bracts about as long as the calyx. Mid to late summer. Shores and wet places. -- (NF), NS-BC, US, (SA, Eur).

The widespread typical phase is \pm pubescent and finely glandular. On the shores of the estuary of the Saint Lawrence River it is replaced by var. laurentianus (Rolland-Germain) Boivin, glabrous or nearly so, the lower leaves hardly more deeply toothed than the upper, the achenes very narrowly wing-margined.

3. L. asper Greene (L. lucidus Turcz. var. americanus Gray) -- Somewhat fleshy, the leaves and especially the stem thickish. Rhizome thicker near the base of the stem. Leaves tending to be rounded at base. Leaves all similar and serrate. Calyx lobes longer than the tube, acuminate and ciliate. Mid summer. Common on shores. -- Aka, Q-BC, (US).

20. MENTHA L.

MINT

Calyx regular and the corolla almost regular. Stamens 4. Flowers pedicellate.

- a. Flowers in axillary glomerules 2. M. arvensis
 aa. Forming terminal spicate
 inflorescences 1. M. spicata

1. *M. SPICATA* L. -- Spearmint (Baume, Baume vert) -- Flowers barely bilabiate in terminal inflorescences. Usually branchy. Inflorescence ± moniliform. Corollas small, white to pink. Second half of summer. Rare escape from cultivation: Bjorkdale. -- (Aka, NS)-PEI-O, ecS, swBC, US, Eur.

2. *M. arvensis* L. (var. canadensis (L.) Briq., var. glabrata (Bentham) Fern., var. lanata Piper, var. villosa (Bentham) S.R. Stewart; *M. glabrior* (Hooker) Rydb.; *M. Penardii* (Briq.) Rydb.) -- Mint (Baume) -- Flowers barely bilabiate, in numerous axillary glomerules. Flowers pink or mauve. Summer. Common in wet places. -- (seK)-Mack-Aka, L-SPM, NS-BC, US, Eur. *F. albiflora* Rouleau -- Flowers white. Infrequent: Regina -- Q-O, S.

Many minor segregates have been described but the material at hand would seem to indicate that they are essentially sympatric and grade into one another.

21. ELSCHOLTZIA W.

Calyx and corolla almost regular like the last two, but the flower in terminal or axillary spikes. Stamens 4.

1. *E. CILIATA* (Thunb.) Hyl. -- Flowers in strongly secund spikes. Leaves and spikes long petiolate. Each glomerule subtended by a suborbicular bract about equalling the flowers. Corolla pink. Late summer and fall. Rare weed of wet and shady places: Bird's Hill. -- NB-Man, (US, Eur).

A rare weed. Its U.S. distribution was detailed by S.K. Harris, *Rhodora* 61: 63. 1959. In Canada, it is known from only five localities: Birds Hill, Aultsville, Mount Royal, Temiscouta County and Grand Falls.

Order 57. GENTIANALES

A basic type with fused sepals and fused petals. Differs from the Primulales by its stamens alternate with the lobes of the corolla. Ovary unilocular. Fruit a capsule.

- a. Leaves opposite, simple 106. Gentianaceae
 aa. Leaves alternate, compound 107. Menyanthaceae

107. GENTIANACEAE (GENTIAN FAMILY)

Herbs with opposite and entire leaves.

- a. Flower spurred 3. Halenia
 aa. Not spurred.
 b. Corolla tubular 1. Gentiana
 bb. Corolla rotate 2. Lomatogonium

1. GENTIANA L.

GENTIAN

Basic type of the family. Blue-flowered herbs with a resemblance to the Caryophyllaceae, but both the sepals and petals are fused. Flowers mostly large and conspicuous.

MENTHA

- a. Leaves fused into a sheathing base which is commonly $\frac{1}{4}$ to $\frac{1}{2}$ the length of the blade 7. G. aquatica
- aa. Sheath much shorter or even reduced to a mere transnodal line.
 - b. Annuals with variable to very long peduncles.
 - c. Peduncles all or mostly shorter than the flowers.
 - d. Corolla with a crown of fringes in the throat 11. G. Amarella
 - dd. No fringes 10. G. propinqua
 - cc. Mostly many times longer than the flowers.
 - e. Calyx minutely papillose on the keels 9. G. crinita
 - ee. Not papillose 8. G. detonsa
 - bb. Perennials with the flowers subsessile, or at least much longer than the peduncles.
 - f. Stem leaves few, only 2-3 pairs below the inflorescence 1. G. glauca
 - ff. Stem leaves more numerous, mostly 5-10 pairs.
 - g. Leaves ovate to elliptic 2. G. calycosa
 - gg. Leaves broadly lanceolate to linear.
 - h. Primary lobes of the corolla no longer than the intermediate ones 5. G. Andrewsii
 - hh. Primary lobes obviously larger and longer.
 - i. Calyx lobes smooth 6. G. linearis
 - ii. Calyx lobes finely scabrous-ciliate.
 - j. Flowers 3.5-4.5 cm long 3. G. puberulenta
 - jj. Smaller, 2-3 cm long 4. G. affinis

1. G. glauca Pallas -- Stoloniferous perennial with basal rosettes and few stem leaves. Less than 2 dm high. Leaves ovate to narrowly obovate. Flowers green or blue, few, mostly 3-5 per plant. Mid summer. Alpine prairies. -- (Mack)-Y-Aka, swAlta-BC, (nwUS), Eur.

2. G. calycosa Gris. var. obtusiloba (Rydb.) C.L. Hitchc. -- Each stem bearing a single large terminal flower. Calyx lobes large and foliaceous, \pm ovate and about as long as the tube. Flower 3.5-5.0 cm long. Mid summer. Alpine talus slopes in Waterton. -- swAlta-seBC, nwUS.

3. G. puberulenta Pringle -- (G. puberula AA.; Dasystephana GENTIANA)

puberula AA.) -- Like the following, but the flowers larger. Leaves 2.5-4.5 cm long. Calyx lobes linear, at least half as long as the tube and commonly about as long. Late summer. On chernozems, rare. -- swO-sMan, US.

Some grading to the next species has been reported to occur in Manitoba, but we have met with none. The only specimen we have seen annotated as an intermediate, J. Fletcher, Brandon, 1895 (DAO), seems to us typical of G. puberulenta.

The Burgess collection from the Coteau de Missouri (DAO) reported by Macoun 1884 as G. puberula has since been revised to G. affinis. Similar reports by Rydberg 1922 and 1932 could have been based on Macoun.

4. G. affinis Gris. (Dasystephana affinis (Gris.) Rydb.; D. interrupta (Greene) Rydb.) -- Flowers greenish-blue and tubular, with rather short, blue lobes, the latter more or less spreading at anthesis. Leaves (1.5)-2.0-(3.0) cm long. Calyx lobes usually smallish and less than half as long as the tube, often reduced to mere teeth. Second half of summer. Moist prairie spots. -- sMan-sBC, US, (CA).

The range was extended to Mackenzie by Scoggan 1957 on the basis of a collection labelled McTavish, immediate vicinity of Fort Good Hope, July 1856 (CAN), a locality some 1200 miles from the bulk of the range.

A more recent Mackenzie report by Cody 1969 was based in part on the McTavish collection, in part on a Keele River collection (DAO). Both Mackenzie collections have unusually long calyx lobes and may represent a hitherto undescribed variant.

5. G. Andrewsii Gris. (var. dakotica Nelson; Dasystephana Andrewsii (Gris.) Small) -- Closed Gentian. Bottle-Gentian -- Flower barely opening at tip, the lobes very short, about 2 mm long. Herb 5-8 dm high. Leaves and calyx lobes ciliate, the latter dilated, usually narrowly ovate and more or less spreading. Late summer. Low prairies, rare. -- wQ-seS, US -- F. albiflora Britton (G. flavida AA.) -- Flowers white. Local: winnipeg. -- Q-sMan, US.

The corolla is here obscurely 10-lobed. The 5 primary lobes, those that correspond to the tips of the fused petals, are the smaller ones and rather inconspicuous; they are entire, darker blue, and terminate the keels of the corolla. The 5 intermediate lobes, usually termed appendages, are fimbriate, longer and more conspicuous, paler-coloured and usually yellowish; they coincide with the folds of the corolla. These relatively larger appendages characterize G. Andrewsii.

There is a certain amount of variation in the relative length of the lobes and appendages. In specimens from the eastern part of the Canadian range the corolla lobes are reduced to a broadly deltoid tip, mostly less than 0.5 mm high and usually only 1-2 mm wide. Westward, the amplitude of the variation is

gradually greater and, roughly west of the Mississippi, a majority of the specimens have lobes larger than described above. An attempt to give taxonomic expression to this situation will be found in Brittonia 19: 16-22. 1967 in which var. Andrewsii is restricted to plants with corolla lobes less than 1 mm high, while var. dakotica has longer corolla lobes.

While we have not had the opportunity to examine a large series of U.S. specimens, we note that in our area most specimens are intermediate, the lobes being mostly 2-3 mm wide but only 0.5-1.0 mm high and that our plants obviously form a single population. At least as far as our area is concerned, the distinction of a var. dakotica is very difficult to implement and essentially meaningless, being based on the establishment of an arbitrary size limit, without geographical correlation.

6. G. linearis Fröhl. var. lanceolata Gray -- Closed Gentian, Bastard Gentian -- Inflorescence leaves conspicuously broader than the stem ones. Resembles the previous species. Stem leaves eciliate ± lanceolate; the inflorescence leaves broader, ovate to broadly lanceolate. Calyx lobes 5-8 mm long. Second half of summer. Open marshy places. -- NB, O-sMan, US.

The leaves are isomegueth and narrower, 1 cm wide or less, in the more eastern and typical phase.

7. G. aquatica L. (G. Fremontii Torrey; G. prostrata Haenke, var. americana Eng.; Chondrophylla Fremontii (Torrey) Nelson) -- Leaves with a broad to narrow white margin. Small annual, usually less than 1 dm, the stem simple or branched from the base and bearing a single terminal flower. Corolla conduplicate in the angles as in the previous species (but not in the following ones). Fruit long stipitate, often becoming exserted. Early to mid summer. Shores at all altitudes, but rare or overlooked. -- Mack-Aka, swS-BC, wUS, SA, Eur.

G. prostrata is often used to tag such specimens as have broader and more recurved leaves with a narrower membranous margin. Variations in stipe length appear independent from the leaf variations and may perhaps be better related to the maturation of the fruit.

8. G. detonsa Rottb. var. Raupii (Pors.) Boivin (Gentianella detonsa (Rottb.) D. Don ssp. Raupii (Pors.) J.M. Gillett) -- Fringed Gentian -- Like the following, but the keels smooth. Stem mostly 2-4 dm high and leafy in the lower half. Leaves rather narrow, mostly lanceolate to long linear and 2-5 mm wide. Corolla (3)-4-(5) cm long, the lobes erose to short-fimbriate. Mid summer. Shores and marshy places. -- Mack-(Y)-Aka, neAlta.

Two other varieties, var. detonsa and var. nesophila (Th. Holm) Boivin, are known to occur respectively north and east of us. Both have somewhat smaller flowers 2.0-3.5 cm long, are usually smaller plants 2 dm high or less, and will often bear leaves near the base only. They differ in leaf width. In var. nesophila the oblong to spatulate leaves are 5-10 mm wide while those of var. detonsa are narrower in the manner of our var. Raupii. The latter was reported for northern Ontario by Gillett 1957 on the

basis two Dutilly & Lepage (DAO) collections; both have the shorter flowers and broader leaves of var. nesophila and have been revised accordingly.

Various reports of G. barbata and of G. serrata from Alberta and further to the northwest were based mainly on specimens of var. Raupii and also partly on G. crinita var. tonsa.

9. G. crinita Fröhl. var. crinita -- Fringed Gentian -- Showy annual with rather large, 4-merous, blue flower borne on a long peduncle. Leaves \pm lanceolate, 5-20 mm wide. Corolla lobes abundantly fimbriate-margined. Late summer. Wet and drying places. -- swQ-sMan, US -- Var. Browniana (Hooker) Boivin (G. procera Th. Holm) -- Leaves rather narrow, long linear and less than 5 mm wide. Flowers large, at least the central one 4-6 cm long. Corolla lobes much fimbriate. -- O-sMan, ncUS -- Var. tonsa (Lunell) Boivin (G. barbata AA.; G. Macounii Th. Holm; G. tonsa (Lunell) Vict.; Anthopogon tonsus (Lunell) Rydb.; Gentianella crinita (Fröhl.) G. Don ssp. Macounii (Th. Holm) J.M. Gillett) -- Leaves narrow as in var. Browniana, but the flowers small, only 2-4 cm long and little if at all fimbriate. -- sMack-(Y), Q-seBC, (ncUS) -- F. ventricosa (Gris.) Boivin (G. ventricosa Gris.) -- Corolla greenish-yellow, short and included in the inflated calyx tube. Calyx lobes very long and connivent. Rare: Grand Rapids. -- O-cMan.

The range of typical G. crinita was extended west to eastern Saskatchewan by Scoggan 1957, but the latter now thinks (verbatim 1964) that it may have been only a lapsus calami.

10. G. propinqua Rich. var. propinqua (Gentianella propinqua (Rich.) J.M. Gillett) -- Calyx lobes conspicuously of two sizes, the two larger ones at least twice as large as the other two. Resembles the following, but the flowers not fimbriate. Stem usually branched from the base. Peduncles very uneven, usually some of them longer than the flowers. Flowers mauve, drying blue, mostly in groups of 1-3. Mid summer. Wet places in arctic and alpine or subalpine prairies. -- (F)-K-Aka, L-(NF), Q-nMan, swAlta-BC, (nwUS, Eur).

Flowers dimegueth, those terminating the stem and the main branches 1.5-2.0 cm long and about 1/3 longer than the lateral flowers. Var. aleutica (C. & S.) Boivin from southern Alaska has smaller flowers, isomegueth or nearly so, and only 1 cm long or little longer.

11. G. Amarella L. (f. Michauxiana Fern.; G. acuta Mx.; Amarella acuta (Mx.) Raf.; A. plebeia (Cham.) Greene; A. scopulorum Greene; A. strictiflora Rydb.) Greene; Gentianella Amarella (L.) Börner, ssp. acuta (Mx.) J.M. Gillett) -- Felwort -- Throat of the corolla with a ring of fimbriae. Peduncles short, shorter than the flowers, the latter mostly in groups of more than 3. Calyx lobes all narrow and similar. Flowers 1-2 cm long, their colour varying from white or yellowish to mauve or greenish or blueish. Mid summer. Common in wetter places and around Aspen groves. -- G, K-Aka, L-SPM, NB-BC, US, (CA), Eur.

Colour variations do not appear to be taxonomically

significant in this species as the flower colour in any region will normally run the whole gamut of tints from white or yellowish to blue.

Our plants could be distinguished as var. stricta (Gris.) Watson on their reputedly smaller flowers. However Hegi describes the flowers as 10-20 mm long and this happens to be the range of variation in the European as well as in the Canadian specimens studied. The difference is probably statistical only, with the flowers of the European plants apparently averaging a few millimeters longer.

2. LOMATOGONIUM Braun

As in Gentiana, but the flower widely open and more or less rotate. No terminal stigma, but the stigmatic lines are borne laterally along the sutures of the ovary. Sepals practically free; petals fused near the base only.

1. L. rotatum (L.) Fries (Pleurogyne rotata (L.) Gris.) -- No terminal stigma, the ovary stigmatic in lines along the sides. Annual herb with the general presentation of a Gentiana. Peduncles elongate. Flowers showy, \pm mauve. Mid summer to mid autumn. Wetish places, rare. -- G-Aka, L-NF, swNB-BC, (US), Eur -- F. albiflorum Pol. -- Flowers white. -- (G), K, Y-Aka, Q-(neO), S-Alta.

3. HALENIA Borkh.

SPURRED GENTIAN

Corolla spurred.

1. H. deflexa (Sm.) Gris. var. deflexa -- Flower greenish and more or less tinged blue. Leaves broadly lanceolate. Annual herb with the general presentation of a Gentian. Mid summer. Open places in cold woods. -- L-SPM, NS, NB-BC, US, (CA).

In ours the median internodes are rather elongate, but around the Gulf of Saint Lawrence it grades into a smaller var. Brentoniana (Gris.) Gray, less than 2 dm high, the foreshortened internodes being shorter than the leaves.

108. MENYANTHACEAE

(BUCK-BEAN FAMILY)

As in the Gentianaceae, but the leaves basically alternate.

1. MENYANTHES L.

BUCKBEAN

Leaves trifoliate. Corolla lobes bearded inside with large hair-like processes.

1. M. trifoliata L. (var. minor Raf.) -- Bog-Bean, Beaver-Root (Herbe à canards, Trèfle d'eau) -- A palustrine herb with large trifoliate leaves, these alternate on the rhizome. Leaflets 3-10 cm long, narrowly obovate. Inflorescence a raceme of white flowers on a naked scape. Late spring and early summer. Wet places, often boggy, more usually in shallow water. -- G, K-Aka, L-SPM, NS-BC, US, Eur.

Order 58. PLANTAGINALES

Resembles the Gentianales, but the sepals are free while the petals are fused.

109. PLANTAGINACEAE

(PLANTAIN FAMILY)

Herbs with small tetramerous flowers.

1. PLANTAGO L.

PLANTAIN

Fruit circumscissile. Flowers in long or short spikes.

- a. Leaves opposite 11. P. Psyllium
- aa. All basal.
 - b. Leaves coarsely toothed
 - to pinnatifid 5. P. Coronopus
 - bb. Entire or remotely denticulate.
 - c. Leaves narrowly lanceolate
 - to broadly ovate Group A
 - cc. Linear Group B

Group A

Larger leaves at least 1 cm wide and with 5 or more conspicuous parallel nerves.

- a. Bracts long caudate; sepals ciliate and somewhat villous 7. P. lanceolata
- aa. Bracts acute to rounded; sepals glabrous.
 - b. Leaves ovate.
 - c. Filaments very conspicuous and persistent, at least twice as long as the corolla 6. P. media
 - cc. About as long as the corolla and usually not obvious 1. P. major
 - bb. Leaves variable, \pm lanceolate.
 - d. Filaments exerted by 4-6 mm and more or less marcescent 8. P. canescens
 - dd. Only exerted by 1-2 mm and evanescent 2. P. eriopoda

Group B

Leaves narrower, less than 1 cm wide, and usually less than 5 mm wide. Nerves 1-3.

- a. Flowers glabrous.
 - b. Leaves filiform, less than 3 mm wide 4. P. elongata
 - bb. At least 5 mm wide 8. P. canescens
- aa. Villous to long lanate.

PLANTAGO

- c. Flowers short villous, leaves fleshy 3. P. maritima
 cc. Spike buried in villous hairs,
 these over 1 mm long; leaves
 not fleshy.
 d. Bracts 1-3 cm long, con-
 spicuous and blackening
 in drying 9. P. aristata
 dd. Shorter, green and mostly
 not overtopping the
 flowers 10. P. patagonica

1. P. major L. (var. asiatica AA., var. Pilgeri Domin, var. scopulorum Fries & Broberg; P. asiatica AA.) -- Rat-Tail, Plantain (Queue de rat, Plantain) -- A common rosette herb with oval leaves and 5-7 conspicuous parallel nerves. Not woolly among the greenish leaf bases. Scapes few, mostly 1-4 dm high. Corolla lobes about 1 mm long. Seeds most numerous, at least 6, and much smaller, about 1 mm long. Summer. Common weed of footpaths, spreading to shores, etc. -- (G), Mack-Aka, L-SPM, NS-BC, (US), Eur.

Perhaps only an introduced plant in North America, but exceptionally well naturalized in certain habitats. Or perhaps native on shores northward and around the Gulf of Saint Lawrence.

2. P. eriopoda Torrey var. eriopoda (P. Rugelii AA.) -- Similar but coarser, with abundant brownish wool among the reddish leaf bases. Leaves thickish and somewhat fleshy, very variable, mostly lanceolate, the nerves very rugose below, the lower face usually villous. Spike mostly 5-20 cm long. Late spring and early summer. Alkaline prairies. -- Mack-Y, seQ, Man-BC, EU, (CA).

Sometimes resembling P. major, but the seeds only 4 in number and about 2 mm long.

Keewatin reports by Hultén 1949 and Anderson 1950 have not been confirmed.

A south-central Alaska report by Scoggan 1957, repeated by Boivin 1967, may have started as a lapsus for south-central Yukon.

A Nova Scotia report by Gleason 1952 has not been checked, but is likely to be unsubstantiated as were quite a few other canadian range extensions in Gleason.

The more western var. Tweedyi (Gray) Boivin is not so coarse and somewhat smaller. Usually little if at all lanate at base. Leaves not so rugose and the nerves much buried in the leaf tissue except the midnerve. Spike about 5 cm long. Var. Tweedii was reported by Hitchcock 1959 (as P. Tweedyi Gray) from Saskatchewan and Alberta, queried by Boivin 1966. We know of no justifying specimens for our area and the only known canadian collection is from Lavington Creek (DAO) in southeastern B.C.

3. P. maritima L. (P. decipiens Barnéoud; P. juncoides Lam.; P. oliganthos R. & S.) -- Goose-Tongue (Perce-pierre, Passe-pierre) -- Leaves thick and fleshy, almost triangular in cross section. Tufted perennial. Pubescent in the inflorescence, including the corolla tube. First half of summer. Seashores and

rarely inland at salt springs at the mouth of the Red Deer (Man.) and at Heart Lake -- G-(F)-K-(Mack), Aka, L-SPM, NS-nMan, nAlta-BC, US, SA, Eur, (Afr).

4. P. elongata Pursh var. elongata (P. pusilla AA.) -- Glabrous or puberulent annual, not fleshy. Herbage green. Less than 2 dm high, the scapes commonly 5-15 cm long, overtopping the leaves, the latter filiform or narrowly ribboned, up to 3 mm wide. Spikes commonly 2-5 cm long. Flowers commonly 5-8 per centimeter. Perianth glabrous. Capsule 2-3 mm long. Late spring and early summer. Arroyos and exsiccated saline flats. -- (sw Man)-S-sBC, US.

It has been customary to place the Pacific coast plants and some of the Pacific States material into a segregate P. Bigelovii Gray, but the distinction between the two species was so poor that Cronquist ex Hitchcock 1959 was prompted to consolidate the two. We accepted this view in our Enumération of 1966-67.

A recent paper by I.J. Bassett, Can. Journ. Bot. 44: 467-479, 1966, provides a basis for a new and apparently quite workable classification of the Canadian material into three geographical variants.

The typical phase as described above is the only one in our area and it ranges as far west as the Pacific coast, overlapping the range of the other two varieties.

Var. Bigelovii (Gray) stat. n., P. Bigelovii Gray, Pac. Railr. Rept. 4: 117, 1857. Smaller and the shorter spikes denser. Greenish and less than 7 cm high. Spikes less than 2 cm long and usually under 1 cm long, rather crowded, the flowers usually 10-15, per cm. Capsule 2-3 mm long. Mainly coastal from B.C. to California, but also found some distance inland. Most material formerly held as intermediate should be placed in the next variety.

Var. pentasperma (Bassett) stat. n., ssp. pentasperma Bassett, Can. Journ. Bot. 44: 470, 1966. Herbage reddish and the capsules bigger, 3.0-3.5-(4.5) mm long; otherwise somewhat intermediate to the first two. Mostly 5-10 cm high. Spike usually 1-3 cm long and the flowers 5-12 per cm, but appearing rather crowded because of the longer capsules. Largely sympatric to Bigelovii, but more often found somewhat inland rather than along the coast.

To complete the picture, a fourth variety, var. californica (Greene) stat. n., P. californica Greene, Bull. Cal. Ac. 1: 123, 1885, is known to occur from central California to Northern Mexico. Usually confused with the more eastern and primarily planicostal P. heterophylla Nutt.

According to Bassett, var. elongata has 12, var. Bigelovii 20 and var. pentasperma 36 chromosomes.

5. P. CORONOPUS L. -- Star-of-the-Earth, Buck's Horn (Pied de corbeau, Corne de cerf) -- Leaves coarsely toothed to pinna-tipartite. Herbage hirsute. Flowers puberulent, including the corolla tube. Stigmas very long. Early summer to late fall. Rare weed: Brandon. -- G, NB, Man, BC, US, Eur.

6. *P. MEDIA* L. -- Lamb's Tongues, Fire-Leaves (Plantain bâ-tard, Plantain blanc) -- Closely resembling *P. major*, but the obovate leaves tapering to a winged petiole. More pubescent. Stiffly erect scapes arising from a short decumbent base and tending to form an open-ended rib-cage. Corolla lobes \pm 1.5 mm long. Seed 2-4, about 1.5 mm long. Summer. Waste places, rare: Brandon. -- NB-Man, BC, (US), Eur.

7. *P. LANCEOLATA* L. -- Ribgrass, English Plantain (Herbe aux 5 coutures, Oreille de lièvre) -- 2-5-(10) dm high but the dense spike rather short, usually less than 3 cm long. Leaves variable, commonly lanceolate and 1-2 cm wide, long villous, white-lanate among the bases. Corolla lobes around 2 mm long. Summer. Rare weed, especially, unwelcome in lawns; Winnipeg (?) -- (Aka), NF-(SPM), NS-PEI-(NB)-Q-Man (?), BC, US, Eur.

Has been reported from Saskatchewan by Russell 1954 and Breitung 1957, but the corresponding Waskesiu Lake specimen (SASK) was revised to *P. major* in 1956 by Dr. C. Frankton, according to the latter's notes for a once proposed "Introduced Species of Spermatophyta in Sask."

The Manitoba reports of *P. lanceolata* for Oak Point and Carman could not be tied down to vouchers. They stand apparently unverifiable and we are cartesianally inclined to discount anything unverifiable.

The other Manitoba reports can be related to a sheet collected by C.H. Lee (WIN). The corner of this sheet was inscribed "*Plantago lanceolata* L., Man., id. Oct. 1920, I.L.C.". The initials stand for I.L. Conners, who wrote the inscription, and "id" for identified. This corner inscription was covered by a succession of labels. The first one is Manitoba Agricultural College label inscribed "C.H. Lee, plots and fields sown to grass, Summer, id. by C.H.L. & I.L.C.". This is presumably the basis for Jackson's 1922 entry of "*Plantago lanceolata*, Rib Grass (not thriving), intr(duced) in gr(ain) seed." A second covering label was added later; it is of the chartated type that came into use at Winnipeg after 1950; it reads "C.H. Lee, Manitoba, cultivated fields, Summer" and is clearly the label quoted by Scoggan 1957. Presumably (but not unquestionably) this sheet was collected at the Manitoba Agricultural College, as is intimated by the heading of the first label. However it was ignored by Lowe 1943 and has not been confirmed by any later collection. We are reporting it has questionable.

8. *P. canescens* Adams var. *cylindrica* (J.M. Macoun) Boivin (*P. septata* Morris) -- Much as in *P. eriopoda*, except for the long and persistent filaments. Leaves not fleshy but heavily hirsute. Usually not woolly among the leaf bases. Spike less than 1 dm long. Early summer. Foothill and montane meadows. -- (wF), Mack-Aka, swAlta, (nwUS).

Our plants have seeds 1.0-1.7 mm long. Otherwise they differ hardly from the typical phase, an endemic of the Irkutsk area, with slightly larger seeds, \pm 2 mm long.

9. *P. ARISTATA* Mx. -- Buckhorn -- Spike conspicuously long-
PLANTAGO

bracted from base to top. Villous throughout. Annual. Leaves filiform. Bracts mostly 1.0-1.5 cm long, ascending, filiform with a flaring base. Late summer. Rare weed of disturbed soils: Walsh, Manyberries. -- (Y), NS, O, sAlta-BC, US, (CA).

10. *P. patagonica* Jacq. (*P. aristata* AA.; *P. Purshii* R. & S.; *P. spinulosa* DCne.) -- Densely soft and long villous throughout. Grayish to whitish annual with narrow leaves. Bracts green and not conspicuous, or the lower up to 1 cm long. Spike very short or up to half the height of the plant. First half of summer. Wind-eroded steppes and dried-up alluvial flats, often in great abundance, but infrequent. -- sMan-swS-BC, US, SA.

11. *P. PSYLLIUM* L. (*P. indica* L.) -- Fleawort (Oeil de chien, Pucière) -- Branchy annual with opposite leaves. Leaves linear. Spikes short, axillary on long peduncles. Bracts broadly obovate, pilose and ciliate. Mid summer. Rare and evanescent weed of disturbed soils: Brandon. -- (NS), swQ-sMan, BC, US, Eur, (Afr).

Order 59. CAMPANULALES

Resembles the Gentianales, but the ovary is inferior.

- a. Anthers free; corolla regular 110. Campanulaceae
- aa. Anthers connate; corolla zygomorphic 111. Lobeliaceae

110. CAMPANULACEAE (BLUEBELL FAMILY)

Basic and unspecialized type of the order. Single genus with us.

1. CAMPANULA L. BLUEBELL

Basic and unspecialized genus. Flower typically a "blue-bell". Capsule opening by lateral pores.

- a. Stem simple with a single terminal flower.
 - b. Leaves entire or glandular-denticulate 3. C. uniflora
 - bb. Sharply dentate 5. C. lasiocarpa
- aa. Typically many-flowered.
 - c. Stem leaves ovate to lanceolate, at least 1 cm wide.
 - d. Flowers sessile and glomerulate 1. C. glomerata
 - dd. Pedicellate and forming a terminal and secund raceme 2. C. rapunculoides
- cc. Much narrower and narrowly lanceolate to filliform.
 - e. Leaves retrorsely scabrous 6. C. aparinoides
 - ee. Not scabrous and usually glabrous; flowers larger 4. C. rotundifolia

1. *C. GLOMERATA* L. -- Clustered Bellflower (Ganteline d'Angleterre) -- Flowers large and sessile in a terminal and involucreted glomerule. Smaller axillary glomerules sometimes present. Stem leaves denticulate, the upper triangular and amplexicaul, the lower narrower and petiolate. Bracts of the involucre about as long as to slightly longer than the flowers, the latter ± 2 cm long. First half of summer. Naturalized from cultivation into many acres of open Oak bush at Garson. -- Man, Eur.

More commonly cultivated and escaped in North America, but not yet in our area, is cv. Speciosa with larger heads, the flowers ± 3 cm long.

2. *C. RAPUNCULOIDES* L. var. *RAPUNCULOIDES* -- Bellflower, Bluebell (Campanule, Raiponcette) -- Virgate herb with a showy and secund raceme of large blue flowers. Leaves dentate. Calyx scabrous-puberulent. Corolla 1.5-3.0 cm long. Second half of summer. Sometimes cultivated and locally spreading or established. -- (NF, NS-NB)-Q-Man, Alta, US, Eur.

Also naturalized in Eastern Canada is var. ucrainica (Besser) Koch with glabrous calyces.

3. *C. uniflora* L. -- Small inconspicuous herb with a single terminal flower. Stem 1-2-(3) dm high. Flower small, less than 1 cm long. Calyx lobes entire, about as long as the corolla tube. First half of summer. Arctic and alpine prairies. -- G-Aka, L, Q, (nMan), swAlta-seBC, US, Eur.

4. *C. rotundifolia* L. var. *rotundifolia* (var. *arctica* Lange, var. *petiolata* (A.DC.) Henry; *C. petiolata* A.DC.) -- Bluebell, Thimble (Cloches, Clochettes bleues) -- Delicate herb with large, drooping, bell-shaped blue flowers. Leaves strongly dimorphic, the rosette ones broadly lanceolate to deltoid or suborbicular, and dentate, the others linear to filiform and entire. Flowers few and often secund. Corolla tube at least 1 cm long. Early to mid summer. Dry open places. -- G-Mack-(Y)-Aka, L-SPM, (NS)-PEI-BC, US, CA, Eur -- *F. albiflora* Rand & Redf. -- Flowers white. Rare and local. -- NF, (SPM, NS, NB, Man, US).

Calyx lobes setaceous, less than 1 mm wide. Grades into the more western var. alaskana Gray with calyx lobes 1.5-3.0 mm wide, tending to be fewer-flowered or one-flowered, and the leaves commonly wider, \pm lanceolate.

5. *C. lasiocarpa* Cham. -- Calyx lobes sharply and remotely laciniate-toothed in the manner of the leaves. Usually less than 1 dm high. Herbage somewhat villous, the ovary more densely so and often even white-tomentose. Flower large as in the last, but solitary and erect. Mid summer. Scattered in mountain meadows and rocky slopes. -- Mack-Aka, swAlta-BC, (US), Eur.

6. *C. aparinoides* Pursh (*C. uliginosa* Rydb.) -- Marsh-Bluebell -- A weak herb \pm scrambling by its strongly retrorse-scabrous stems, leaf margins and midnerves, often forming tangled masses. Otherwise glabrous. Leaves \pm linear. Flowers few, terminal and axillary on long peduncles. Corolla about 1 cm long, pale blue, its tube variable, often shorter than the lobes. Summer. Marshy places. -- NS, NB-cS, US, Eur.

111. LOBELIACEAE

(LOBELIA FAMILY)

Much as in the last and often united with it. Flowers zygomorphic; anthers connate.

- a. Flowers pedunculate 1. Lobelia
 aa. Flower topping a very long
 and sessile ovary 2. Downingia

1. LOBELIA L.

LOBELIA

Two of the anthers smaller, the anther-tube thus asymmetrical and arching.

- a. Leaves all basal; submerged
 aquatic 1. L. Dortmanna
 aa. Terrestrials with leafy stem.
 b. Leaves linear, entire 2. L. Kalmii
 bb. Broader and serrate 3. L. spicata

1. L. Dortmanna L. -- Water-Gladiole, Water-Lobelia (Lobélie tutélaire) -- Submerged aquatic of shallow waters with its flowering raceme protruding above the surface. Rosette leaves numerous and falcate, thickish and hollowed out by 2 tubes separated by the midnerve. Stem leaves reduced to small filiform bracts. Flowers pale blue. Mainly mid summer. Fresh water shallows. -- NF-SPM, NS-O, nS, wBC, US, Eur.

Possibly common across the extreme north, but we know it yet only from Portage-La-Loche and lakes Athabaska, Carswell, and Windrum. Two Alberta dots on a map by Hultén 1958 seem questionable.

2. L. Kalmii L. (L. strictiflora (Rydb.) Lunell) -- Lower lip of the bilabiate blue flower with a large white patch and 3 divergent lobes. Upper lobes reflexed. Small and rather gracile, weakly-rooted perennial. Lower leaves oblanceolate, the others linear. Flowers few, axillary or somewhat racemose. Mid summer. Boggy places. -- Mack, NF, NS, NB-BC.

An Alberta report by Moss 1959 of the white-flowered form, f. leucantha Rouleau, seems unsubstantiated; it is not an improbable occurrence and may have been merely speculative. Other speculative Alberta entries will be mentioned later on.

3. Lobelia spicata Lam. var. spicata (var. hirtella Gray; L. hirtella (Gray) Greene) -- Highbella -- Habitally similar to the last but somewhat coarser, with larger dentate leaves and more numerous flowers in a denser spike. Virgate. Leaves lanceolate to obovate. Towards mid summer. Low meadows. -- NS-Alta, US -- F. campanulata (McVaugh) Bowden -- Anthers white, sterile. Corolla blue or more often white. -- Q-Man, US.

We are somewhat perplexed by the single known Alberta occurrence, a Brinkman collection from Craigmyle (US). Besides having never been confirmed, it is removed from the rest of the range by hundreds of miles.

The commonly distinguished var. hirtella Gray is found from
 LOBELIA

Nova Scotia to Alberta and is essentially sympatric to the glabrous phase. Both varieties appear to grow frequently together, judging from the high proportion of herbarium sheets that carry a mixture of phenotypes. The recognition of var. hirtella is of no obvious intellectual import.

However, a better justified variety is the more southern var. scaposa McVaugh, its leaves strongly dimegueth, the stem leaves fewer, smaller, and very narrow, the basal leaves much larger, usually 2-3 cm wide.

L. siphilitica L. var. ludoviciana A.DC. is supposed to occur in Canada in the Turtle Mountain. The justifying specimen is Burgess 139, Turtle Mt., low open prairie, July 26, 1874 (TRT). Not only has this never been confirmed in nearly a hundred years, but the specimen itself is hardly convincing as it consists only of a stick bearing 8 leaves but no inflorescence. Further, the path followed by Burgess and the main body of the surveying party ran from Pembina, one mile south of the International boundary, westward to the southern edge of the Turtle Mtn. in North Dakota, hence to the first crossing of the Souris River. The stick referred to is therefore likely to have been collected in North Dakota. A brief description of the trip of T.J.W. Burgess will be found in Journ. Proc. Ham. Ass. 4: 117-120. 1888 and a more detailed one in Dawson's report of the boundary survey published in 1875.

2. DOWNINGIA Torrey

Ovary inferior, exceptionally long and sessile.

1. D. laeta Greene -- Small herb with ovaries often half as long as the height of the plant. (Annual?). Stem thickened towards the base. Leaves few, lanceolate. Flowers few, axillary. Corolla blueish, small, mostly shorter than the calyx lobes. Elongate ovaries resembling thickened peduncles. Summer. Arroyos, very local: Crane Lake, Skull Creek, Foremost. -- swS-seAlta-(BC), US.

Order 60. ASTERALES

Floral type of the last, but the inflorescence much reduced and the flowers congested into an involucre head which is functionally homologous to a flower and is often popularly so called. Calyx much reduced or transformed into some kind of dispersal mechanism, usually a pappus.

- a. Flowers 4-merous; anthers free 112. Dipsacaceae
 aa. 5-merous; anthers connate 113. Compositae

112. DIPSACACEAE

(TEASEL FAMILY)

Flowers in involucre heads, like the next, but stamens only 4 and their anthers free. Each ovary subtended by a bract and enclosed in a secondary involucre of fused bractlets.

1. KNAUTIA L.

Lacks the bract which otherwise subtends each floret in this family. Calyx more or less modified into a setaceous pappus.

1. K. ARVENSIS (L.) Duby (Scabiosa arvensis L.) -- Blue-buttons, Gypsy's Rose (Oreille d'âne, Mirliton) -- Leaves opposite, the middle and upper pinnatifid and with a larger terminal segment which is more or less toothed. Lower and basal leaves more or less entire. Herbage long villous or hirsute. Flowers mauve, pilose, the outer somewhat larger. Pappus yellowish. Towards mid summer. Sporadic escape, mostly along roadsides. -- NF, NB-BC, Eur.